25¢
FOREIGN 35c

AMERICAN Cinematographer

THE MOTION PICTURE CAMERA MAGAZINE

March
1943

"*Action*" **ON LAND . . . ON THE SEA . . . AND IN THE AIR!**

FIGHTING CAMERAMEN of the U. S. Armed Forces are shooting the action as it happens. They're filming history in the making and they're making photo history doing it. ¶ Dependable film is a must. There's no chance for a retake on the firing line. Du Pont "Superior" Films for cine shots are helping Uncle Sam's front line photographers to get the story in breath-taking pictures. ¶ This film has fighting quality, too. It defies swift changes in temperature. It retains full quality from exposure to development. Fine grain . . . latitude . . . contrast . . . speed . . . whatever the requirement, cameramen can depend on du Pont "Superior" Films even under the most difficult working conditions.

DU PONT
REG. U. S. PAT. OFF.

"SUPERIOR"
CINE FILM

Better Things *for* Better Living
. . . *Through Chemistry*

SUPERIOR 1 (*Type 104*) A fine grain film especially suited for taking background negatives and for general outdoor use. Has moderate speed . . . requires normal development.

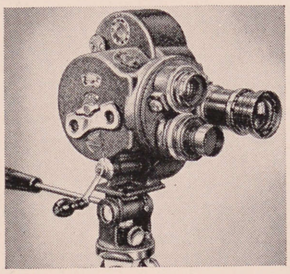
SUPERIOR 2 (*Type 126*) Combines high speed, fine grain, long scale gradation and a well-corrected panchromatic response. An ideal all 'round film for general use.

SUPERIOR 3 (*Type 127*) Meets exacting requirements under adverse lighting conditions. Almost twice as fast as Superior 2, yet it retains remarkable fine grain.

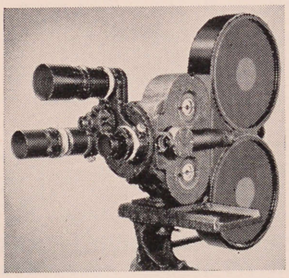
E. I. DU PONT DE NEMOURS & CO. (INC.)
Photo Products Department
WILMINGTON, DELAWARE—SMITH & ALLER, LTD., HOLLYWOOD, CALIF.

THE *Spectacular* EYEMO FOR UNUSUAL SHOTS

ARTHUR MENKEN, *Paramount Newsreel man,* using his Eyemo "somewhere at the front." His choice for this work is a model with the offset turret which permits simultaneous mounting, without interference, of a wide range of lenses.



EYEMO MODELS L AND M have the compact type of three-lens turret. Viewfinder is matched to 6 lens focal lengths by turning a drum; shows "sound" field to match camera's "sound" aperture plate. Operating speeds: Model L—4 to 32 frames per second; Model M—8 to 48.



EYEMO MODELS P AND Q most complete of the seven standard models, have three-arm offset turret, prismatic focuser with magnifier, and provisions for electric motor and external film magazines. Speeds: Model P—4, 8, 12, 16, 24, and 32 f.p.s.; Model Q—8, 12, 16, 24, 32, and 48 f.p.s.

WANTED—Eyemo Cameras for Government Use

Special arrangements are being made in our service department to recondition for Government use all of the Eyemo Cameras we can obtain. You may have exactly the lenses needed for important military service. If you will sell—fill out the information blank in this advertisement.

ARMY E NAVY

BUY
WAR BONDS

PRECISION-MADE BY
Bell and Howell

Since their introduction seventeen years ago, Eyemos have been known as the cameras that really get the pictures—shots that are difficult or impossible with any other 35mm. camera. Eyemos have long been praised, too, for their unfailing performance under conditions trying to both man and machine.

Now, all seven Eyemo models are again demonstrating their amazing stamina and versatility on the battle fronts of this global war. The need of our armed forces for Eyemos is so great that, for the duration, none can be made for civilian service.

But when America's Victory makes them available for civilian service again, one of the seven models will suit your requirements—or we will modify it so that it will meet your exact needs. You will never have to accept a compromise in an Eyemo.

Bell & Howell Company, Chicago; New York; Hollywood; Washington, D. C.; London. *Established 1907.*

EYEMOS WANTED

BELL & HOWELL COMPANY
1848 Larchmont Avenue
Chicago, Illinois

Date....................

Gentlemen:

I own an EYEMO Camera, Model......, Serial No...........

It has been modified as follows:...........................

....

I will sell this camera for $............ and will pay transportation and insurance to Chicago. The camera is:

...... In good operating condition

...... Inoperative or damaged (give details):.........

....

....

Price above *includes* these lenses:.........................

....

I offer the following additional lenses at the prices shown below:...

....

Name........................Address....................

City & State.. AC 3-43

Do *Not* Ship Until You Receive Instructions from Factory!

AMERICAN CINEMATOGRAPHER

THE MOTION PICTURE **CAMERA** MAGAZINE

VOL. 24 MARCH, 1943 NO. 3

CONTENTS

Shooting Action Movies in the African Desert .... *By* CAPT. OSMOND H. BORRADAILE 86

"Special Effects" and Wartime Production .. *By* BYRON HASKIN, A.S.C. 89

Tempo in Industrial Films .... *By* FRANK H. KIRCHNER 90

Direct-16mm. vs. 35mm. for Training Film Production .... *By* WILLIAM A. PALMER 91

Aces of the Camera—XXVI: Robert De Grasse, A.S.C. .... *By* WALTER BLANCHARD 92

Through the Editor's Finder 93

A.S.C. on Parade 94

Photography of the Month 95

A "Model EE" Grows Up .... *By* PHILIP A. JACOBSEN 96

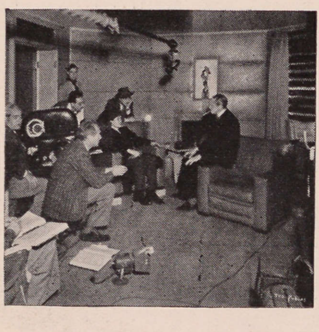
Professionalizing the Bolex .... *By* WILLIAM STULL, A.S.C. 98

The Useful Hyperfocal .... *By* JOSEPH WALKER, A.S.C. 100

Practical Pointers on 16mm. Sound Projection .... *By* JOHN W. BOYLE, A.S.C. 102

Among the Movie Clubs 104

16mm. Business Movies 106



The Front Cover

This month's cover shows Nick Musuraca, A.S.C. (left) and director Richard Wallace discussing the angle for a shot to intercut with the scene they have just filmed for RKO's "The Fallen Sparrow." On this page, at the left, we see them making that reverse-angle. Note characteristic RKO-Cunningham blimp and the use of "Dinky Inkies" and baby spots on floor and behind the furniture. Stills by Alex Kahle.

The Staff

•

EDITOR
William Stull, A.S.C.

•

TECHNICAL EDITOR
Emery Huse, A.S.C.

•

WASHINGTON STAFF CORRESPONDENT
Reed N. Haythorne, A.S.C.

•

MILITARY ADVISOR
Col. Nathan Levinson

•

STAFF PHOTOGRAPHER
Pat Clark

•

ARTIST
Alice Van Norman

•

CIRCULATION
Marguerite Duerr

•

ADVISORY EDITORIAL BOARD
Fred W. Jackman, A. S. C.
Victor Milner, A. S. C.
James Van Trees, A. S. C.
Farciot Edouart, A. S. C.
Fred Gage, A. S. C.
Dr. J. S. Watson, A. S. C.
Dr. L. A. Jones, A. S. C.
Dr. C. E. K. Mees, A. S. C.
Dr. W. B. Rayton, A. S. C.
Dr. Herbert Meyer, A. S. C.
Dr. V. B. Sease, A. S. C.

•

NEW YORK REPRESENTATIVE
S. R. Cowan, 132 West 43rd Street
Chickering 4-3278 New York

•

AUSTRALIAN REPRESENTATIVE
McGill's, 179 Elizabeth Street, Melbourne,
Australian and New Zealand Agents

•

Published monthly by A. S. C. Agency, Inc.
Editorial and business offices:
1782 North Orange Drive
Hollywood (Los Angeles), California
Telephone: GRanite 2135

•

Established 1920. Advertising rates on application. Subscriptions: United States and Pan American Union, $2.50 per year; Canada, $2.75 per year; Foreign, $3.50. Single copies, 25c; back numbers, 30c; foreign, single copies 35c, back numbers 40c.

Copyright 1943 by A. S. C. Agency, Inc.

•

Entered as second-class matter Nov. 18, 1937, at the postoffice at Los Angeles, California, under the act of March 3, 1879.

66

3 things to do to conserve film

WARTIME is no time to have to do re-takes. Film must be used carefully.

So remember these three suggestions: (1) Be *doubly* sure of your exposure before you start shooting. Extra care here will save your film and your money.

(2) Be sure you're using the right film for the scene. On indoor shots like the one above, or for any *changing* light condition, use an extra-fast film. You can't buy a faster film than Agfa Ansco Triple S Pan. In addition to its great speed, it has balanced contrast to provide desirable brilliance outdoors, yet avoid harsh effects under artificial light. It has plenty of latitude too.

(3) If you have any technical photographic questions that we can help you with . . . send 'em in. We've established an information service for you to use whenever you choose, and free of charge. Address your letter to Agfa Ansco Information, Binghamton, New York.

Agfa Ansco

8 and 16 mm.

TRIPLE S PAN
Reversible Film

SHOOTING ACTION MOVIES IN THE AFRICAN DESERT

By CAPT. OSMOND H. BORRADAILE*

THERE is little that I can add to what has already been printed about military cinematography, but, nevertheless, here are a few of the difficulties I experienced in trying to get a photographic war record. Although I held an Army commission, I was very fortunate to have seen action in the three branches of the service, all of which offered different problems for the cinematographer. Those of the Army, I consider the most numerous and varied. If the cinematographer is permanently attached to one unit he is well established and his problems are fewer, for he has not to worry about such matters as rations, transportation, winning the good will of the senior officers (without which he will not achieve much during a campaign), but his scope is limited.

When a roving cinematographer such as I was visits a unit—usually because he has been tipped off that interesting things might be happening there—he must, first of all, be able to definitely prove his identity; secondly—and this is not always an easy job—to convince the Commanding Officer of the value of propaganda and of the importance of getting a historical record; a persuasive line that I often found successful was that the folks back home may have a chance of seeing his men in action on their local screen.

This procedure is always easier if the visitor can assure his host that he has an understanding of military behavior, and will not unnecessarily jeopardize the lives of his men. Another point of importance is that the visitor is self-sufficient as to rations and transportation. To give an idea of some of the problems the cameraman has to be prepared to face, I shall recall a typical Western Desert incident.

Things had been comparatively quiet, when suddenly the enemy broke through the wire with two hundred tanks and three hundred supporting vehicles. I lost no time in collecting my driver; together, we drew thirty gallons of petrol, a week's rations, twenty gallons of water (which was plentiful at our base). We packed all this, together with our bedding and equipment, into our open light truck, taking care to secure it well and endeavoring, by the use of tarpaulins, to do the almost impossible: protecting it against the penetrating desert dust.

We drove to a famous Armoured Division where I was known and with whose tanks I hoped to go into battle—but they retired, hoping to coax the enemy into a more suitable place before giving him battle. That night we slept under the bright stars, feeling confident that with the coming of dawn we would be busy, for surely the battle would be joined that day.

Instead, dawn brought us signals that Jerry had already turned back to his own lines. No, he would not fall into our trap! This was bad news to me, so I took leave of the C. O. and with warnings and the latest information as to the enemy's position, we set out on a compass course into the desert.

It was a hot windy day with poor visibility due to the dust. The wind was on our tail which, together with the soft sand frequently caused the old bus to over-heat and boil. At first, I was generous with our precious water for I was anxious to reach the escarpment where I hoped to leave the dust and possibly see some signs of Jerry. But we soon found that radiator much too greedy, so after filling her up again, we tried a new system of driving on our course until she began to boil, then swinging the car around into the wind. Slowly, she would cool off enough to allow us another run of perhaps a mile. This was slow going and it was a tired, dusty pair of soldiers who finally reached the escarpment and found a trail up just before sunset.

Here we found tracks leading west; we identified them as British, so we followed them. As darkness overtook us, we drove into a wadi and were challenged by a friendly sentry. After I had established by identity to the satisfaction of the Intelligence Officer, I was paraded before the General—a plucky little fellow who a few weeks later was captured and succeeded in escaping, leading many of his men back through the enemy lines.

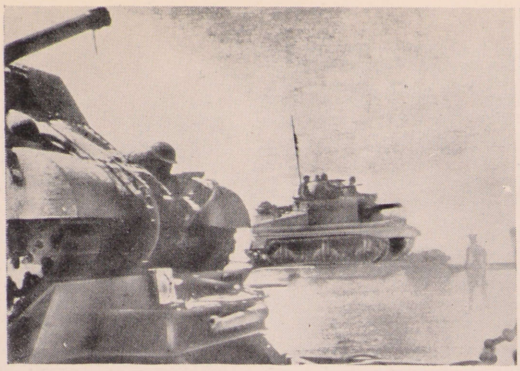
After winning the General's confidence and assuring him that I had my own water supply and would not therefore encroach upon his—which was, at that time, nearly one half gallon per man per day for all uses: washing, cooking and drinking—it was agreed we would start off at dawn, hoping to find some evidence of the invaders.

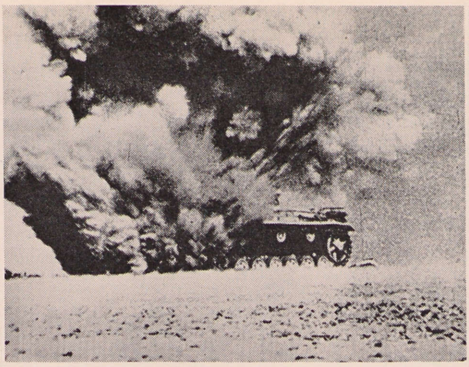
A few miles beyond the wadi we picked up German tank tracks; these we followed until climbing out of a little depression our two cars stopped short for, coming over a rise and bearing down on us were two armoured cars: Friend or foe—? We grabbed our rifles. On seeing us, they separated, took up position of advantage and stopped.

We scrutinized each other through our field glasses; satisfied we were friendly they closed in on us. I grabbed some pictures of them as they came alongside, as they had a couple of prisoners aboard,

---

* The author, Captain Osmond H. Borradaile, was for many years a member of the A.S.C. when he worked in the Hollywood studios before returning to England. Since the outbreak of the War, he has been on active service as an officer in the British Army Film Unit. Seriously wounded filming a convoy en route to Tobruk while under siege in the fall of 1941, he has been invalided out of service and is now with the Canadian National Film Board. THE EDITOR.





Italian airmen whom they had just picked up.

These armoured car boys told us that our bombers had caught a concentration of Jerry tanks refuelling at a point ten miles to the south and it was in that direction that I stood the best chance of meeting up with some Jerries. As the General was more interested in spotting new gun positions, we parted company.

Yes, the bombers had had a bit of sport, for there lay one of Jerry's latest tanks, with its mutilated crew still smoldering away, giving off that strange, unpleasant smell so distinctive of human flesh. Besides the tank, there were two burnt-out petrol lorries, two ammo-carriers and a staff car. Too bad I didn't get a shot of that! But twice we had to "lie doggo" as enemy planes came over, though I could never resist a shot at them with my rifle.

While we were trying to scrape together the remains of a German and bury them, another armoured car drove up and told us that all the Jerries were now back behind their own wire except for a few more tanks which had been knocked out. So, feeling a bit disappointed, we set compass course and headed for our wadi where the General treated me to a drink and what at that time seemed a damn good meal.

The foregone will give you some idea of days spent by those who seek to get action shots on the desert, but fails to give all the problems for—had I been able to catch up with Jerry—the next thing would have been to get into a position from where I could photograph them without being spotted and knocked out. The shimmering heat waves, which so often prevail, make the use of long focal-length lenses impractical, and to make the job more difficult, desert warfare is a war of dispersal, and the camouflage boys are far too good at their jobs.

Learning of our coming November offensive and believing it would be from the low-flying bombers strafing Rommel's tanks that the best shots could be secured, I managed to win myself a home with a South African Squadron who were at that time flying Martin Marylands—a four-crew medium bomber.

At first, the C. O. would only allow me to go on test flights as carrying me meant that one member of the crew would be left behind—a very unpleasant and unfair situation for the kite and other crew members in the event of an attack by fighters when all members depend on each other to do their job and fight their way home. It was however agreed that I should be allowed to take a course in air-gunnery and if my score proved satisfactory I would be allowed to ride as No. 4 (rear gunner), with the understanding that should we be attacked the guns immediately took priority over the camera. This latter stipulation I planned to overcome by camera-mounts and remote controls so that both guns and cameras could be worked together.

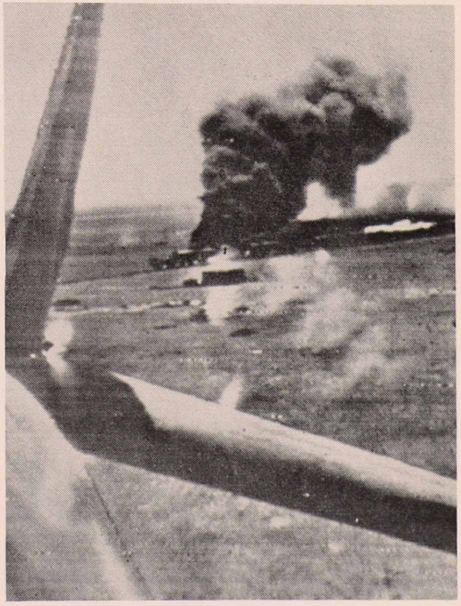
Long years of pointing cameras seemed to aid me in aiming machine guns, for I was very soon accepted as an air-gunner. The first few raids I went on were very interesting, but not too spectacular. They were high-level shows around the 20,000 foot mark.

We would be called before dawn, enjoy a hot breakfast in the cool air, go to the briefing tent, be given all the details of the job on hand, including information from Intelligence gained by reconnaissance flights and other means; the latest weather reports and so on. We then piled ourselves and flying kit into trucks which drove us to our planes, which had already been revved up and taxied to the take-off point.

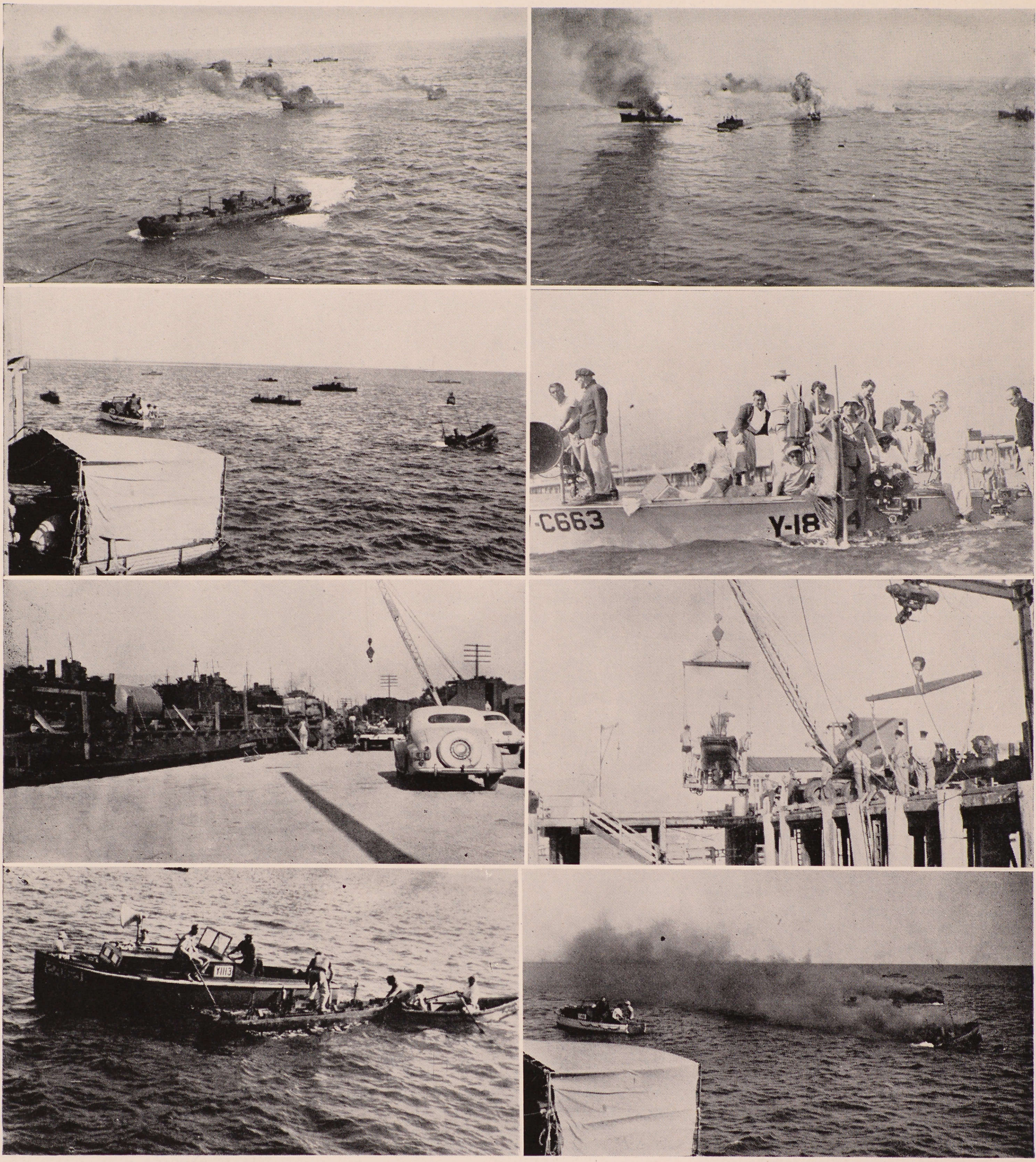
At the last minute, we pulled on our heavy kit and climbed into our kites, me with my cameras which, in an endeavor to protect from the dust, I carefully wrapped in silk which I had salvaged from an Eyetie parachute which had not done its wearer much good. We then tested our oxygen supply and our inter-communication system, the latter a most important procedure for it furnishes the only possible means of contact between the foreward members: No. 1, the pilot, and No. 2, the navigator bomb-aimer, and the rear members: No. 3, the radio-operator, and No. 4, the gunner, for between the foreward and aft stations is the bomb-bay with its unfriendly load.

To me, our take-off was always dramatic. As No. 1 opened the throttle and we slowly began to move, the ground crew always gave us a cheery smile and wave. As we collected speed, the huge plume of cream-colored dust blotted them from view. Tearing along, we would see, a few hundred yards beyond the starboard wing, our tents—our desert homes—with the boys watching, slide by to be swallowed up by that ever-growing and pursuing dust monster. Our

(Continued on Page 117)

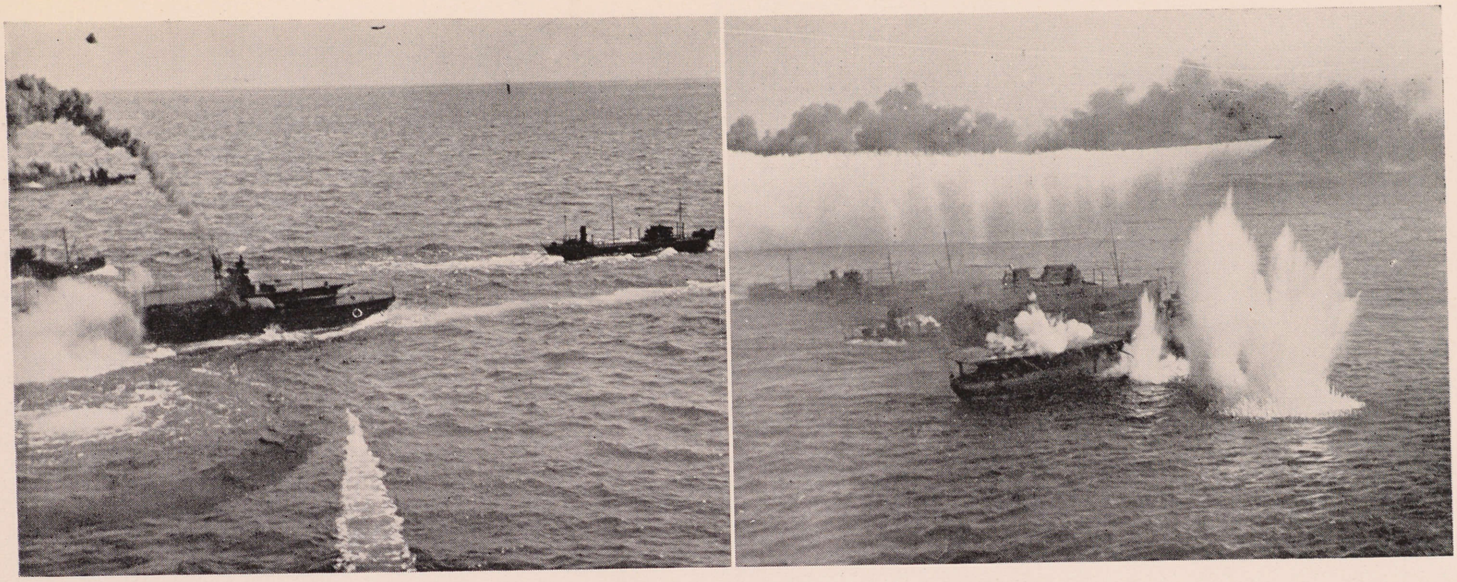


Above, left, "General Grant" tanks ride to the front on tank carriers; middle, a direct hit on a German tank; right, R.S.A.A.F. "Boston" bombers take off from a desert airfield. Below, A Douglas "Boston" of the South African Air Force bombs enemy transport and (bottom) strafes a Nazi supply-train. British Official Photos.



SPECIAL-EFFECTS IN ACTION.

Above, top row: miniature scenes of a submarine attack on a convoy from "Action in the North Atlantic." Note burning ships and "Liberty" freighter attempting to escape. Second row: left, filming a sinking in miniature; right, cameras mounted on motorboat, just above waterline, for low-angle shots. Third row: left, loading the miniature ships on flat-cars for shipment to location. Two of these "miniature" ships fill a 50-foot flat-car. Right, lowering the ships into the ocean from the pier at Santa Barbara. Note size of ship in comparison to men riding the crane beside it. Bottom: left, servicing the miniature freighter between takes; note size of ship as compared to speedboat and rowboat alongside. Right, a burning cargo-carrier goes to the bottom—in miniature. On Opposite Page: bombers and torpedoplanes attack a Japanese convoy in miniature scenes for "Air Force." Note torpedo wake (left) and airplane laying smoke-screen (right). The latter required the rigging of over 600 feet of wire to support the miniature plane.



"Special-Effects" and Wartime Production

By BYRON HASKIN, A.S.C.

Supervisor of Special-Effects,
Warner Bros.' Studio

A FEW weeks ago a group of our highest-ranking Naval officers assembled in a Washington projection-room for a private preview of a Hollywood film dealing with Naval matters, and culminating in sequences of spectacular Naval battle. When the screening was over, this audience of Naval experts congratulated the studio representatives enthusiastically. "Gentlemen," the highest-ranking Admiral present is reported to have said, "I wouldn't have believed our forces on the West Coast had time to afford you such extensive and thorough cooperation, or that your cameras could so convincingly capture the atmosphere of Naval actions."

The fact is that with the exception of a few sequences of action and background-scenes made in a West Coast Navy Yard, the Navy did *not* take time out from its vital business of convoying cargoes across the Pacific. The scenes which so won the Admiral's admiration were created in the studio by the staff of that organization's special-effects department.

This little incident clearly epitomizes one of the most important services special-effects cinematography is rendering the industry today. With our country at war, it is only natural that stories hinging to a greater or lesser extent upon military, naval and aerial battles should form a considerable proportion of almost every studio's production schedule. And while the Army, the Navy and the Air Force gladly cooperate with the industry to the fullest extent possible, under wartime conditions they cannot cooperate to the extent they sometimes did in times of peace. They cannot afford to have two or three squadrons of fighting or bombing planes tied up for weeks at a time for picture-making purposes; and "loaning" a studio a battleship, a cruiser or two, or a flotilla of destroyers is even more obviously out of the question. The answer is that these scenes must now be staged by the special-effects department.

Similarly, climatic scenes in which warplanes are crashed, tanks destroyed, or warships sunk—whether ours or the enemy's—must obviously be done in miniature.

It may be pointed out that there are in existence documentary films photographed by military or naval cameramen, which show these things occurring in actuality, and that in addition, under certain circumstances, it may at times be possible for a skeleton studio unit to accompany a naval convoy, or to work with land or air troops in training areas, to obtain background and cut-in scenes of documentary actuality.

But this argument brings up a fact which is often overlooked even by picture-wise studio executives: the fundamental difference between scenes of actual battle, and battle scenes which must fit into the dramatic and visual pattern of an entertainment movie. Not only must the action conform rather closely to the dramatic requirements of a prearranged story; it must also conform to the visual and psychological patterns of the entertainment film.

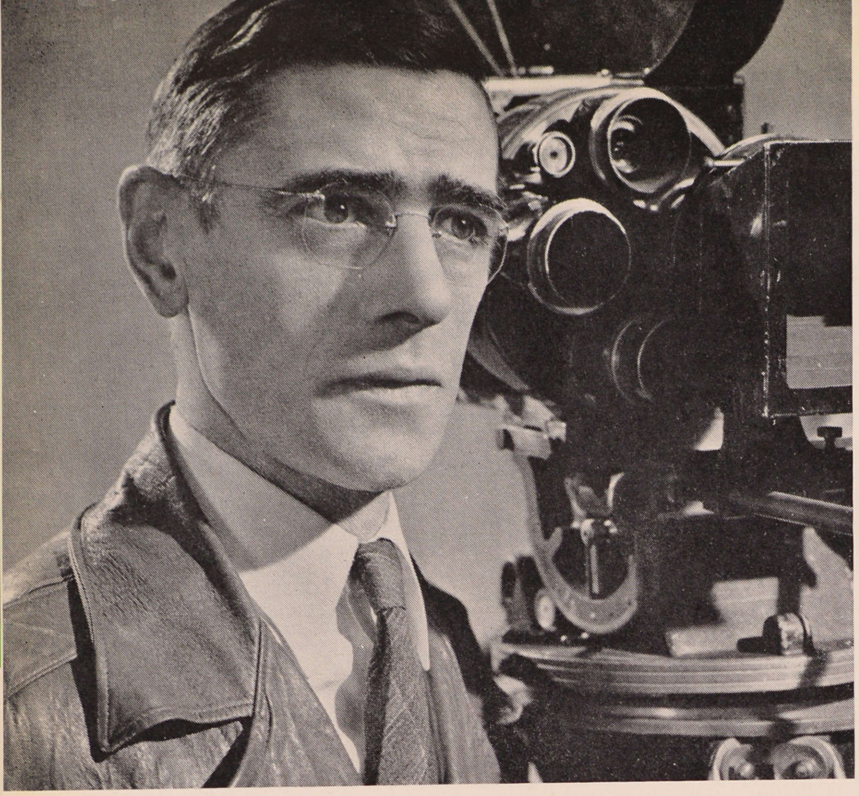
The action must, in a word, be compressed to fit the screen. Modern battles, generally speaking, are rather long-range affairs. At best, the camera can only focus on a small part of the action as a whole. A modern convoy, for example, may comprise from fifty to two, three or even four hundred freighters, transports and escort vessels; no less than 800 ships, I believe, participated in transporting our forces for the recent invasion of North Africa.

It is much easier to write about a 200-ship convoy than to photograph it. You can paint word pictures of a double or triple row of ships extending as far as the eye can see in both directions. But you cannot put it on the screen; when the ships are strung out over a distance of five or ten miles or more, no possible camera-position or lens will enable you to put more than two or three ships—half-a-dozen at most—on the screen at once. And on the screen, the images of the ships will be small—too small to convey the desired impression of actuality—and generally hidden by atmospheric haze, as well.

Suppose an aerial attack is made on the convoy. You've seen the real thing in the newsreels: it gives you a thrill because you know it *is* the real thing—but not, as a rule, because of anything you see on the screen. You see the black puffs of the anti-aircraft shell-bursts. Maybe you see a tiny black pin-point weaving among them; the narrator tells you it is an attacking torpedoplane. You see another, slightly larger black speck in the distance, surrounded by tiny white specks. Only the narrator's voice tells you that the black speck is a 20,000-ton aircraft-carrier being dive-bombed, maybe to death.

To conform to the pattern of the dramatic picture, this action must in-

(Continued on Page 114)



Tempo In Industrial Films

By FRANK H. KIRCHNER

Chief Photographer, Caterpillar Tractor Co.

TEMPO can be maintained in any industrial film only if the producer can forget the "run of mine" scenes where "the whistle blows and our 7,280 employees leave the plant"—"our shipping rooms"—"our testing laboratories." These scenes may mean much to plant heads and employees, but become boring to the prospect—and for whom but the prospect was the film planned?

We would like to emphasize here that in planning "Caterpillar" films we try always to keep in mind not what we would LIKE to show, but what OTHERS would like to see.

Industrial film producers can well follow the methods of circus entertainment. Open with blare, hold 'em with short, interesting sequences and close on time. Or vaudeville's method of "making 'em whistle the tune" as they leave the theatre. Films, like preachers' sermons, can be ruined by failing to say "Amen" at the right time. It's better to have an audience wish for more than to have it "serve on fatigue duty."

Titles are important. There are three requisites for any title. First, make it easy to say and remember; second, allow the title some spot or relation in the subject; third, let the title background have attractiveness and/or action—preferably action, for as the picture first comes on the screen it must immediately get attention and hold it. Fast readers of titles will be held by the interest in the background action.

The title "War Against Waste"—our current film on industrial salvage—is easy to say and remember. Even if remembered as "War On Waste" it hasn't departed from the original thought. The title is casually mentioned once during the narration and stressed at the finale in the narrator's concluding words. These words, followed promptly by martial closing music, emphasize to every loyal person in the audience the vital need for saving and salvaging scrap.

As for the background action on the presentation and main titles, one might think of using a booming cannon to fire the words "War Against Waste" off the screen. Our subject is a war in one sense, but reclamation is a war against inanimate things—a war against the waste of metal, tools, dies, rubber, wood and paper. Thus we used for a background a pile of steel scrap upon which a huge electromagnet falls, dragging away all the metal that holds to the charge. Seeing that mass of homely, jagged pieces of precious metal makes one REMEMBER there's a SCRAP going on—suggests that the pile may contain pieces of the old lawnmower the spectator donated to his scrap drive—hints that now, at last, the donor will really see what becomes of scrap metal.

Carrying on after our main title we "surprise" the audience briefly with a few scenic shots depicting America, heretofore, as a peaceful land of plenty, with laden orchards, fields of grain, acres of cornfields and herds of dairy and beef cattle. This leads quickly to the arrival of war and the need to conserve the nation's resources.

We then take the audience into the great "Caterpillar" plant to show how our reclamation department does its part to salvage, reclaim and conserve material of war. It is here that the film's action and interest gain momentum—tempo rises—action—speed—a big job to do—doing it.

Inasmuch as "War Against Waste" is a MOTION picture, only scenes and machines having action were selected. Scenes of the welder's sparks—grinders — moving gears — spilling oil — flying chips from revolving cutters—they all stress the act of doing something necessary to speed the day of victory.

Even though our plant covers more than 166 acres of ground and offers splendid views of endless rows of machines in operation, there is little overall interest in such scenes. Therefore, the settings are held to CLOSE-UPS. If necessary the operator's hands are included to show comparative size, but the main objective is machine action, photographed close enough to show the curling chips from the machined pieces actually "falling into the lap" of the audience.

Effective lighting has much to do with bringing out the interest of any industrial operation. Incidentally, the lights used throughout the production were the simple spot floodlights, except in a few foundry scenes and the cupola charging room where we were obliged to use our 10 Mole Richardsons. These small floods, fitted with clamp handles and built-in reflectors, were fastened to any projecting part on or near the operation, making it possible to get effects which would be impossible with larger lamps on rolling stands. Too, moving and using bulky equipment around a factory cut deeply into valuable man-hours and flat plain lighting can also drop the tempo of interest.

Camera-angles were employed with care. Use of low angles wherever possible helped bring the operator's face into the frame and heightened and strengthened scenes when the ceiling or skylight appeared in the background. Odd angle scenes usually raise the question, "How did you do that?" Any question as to "how" proves that attention has been paid, and interest has been held—and attention and interest are the goal in planning any film.

High camera-angles have their place depending on the operation. The principal thought on any angle is to see the complete operation without a pan or tilt. Let the operation do the moving—but hold the camera STILL. A held position can be framed correctly but a panned scene is "pot luck."

Camera dissolves always carry a smoothness of action and go far toward eliminating "dragged out" footage. Short action scenes dissolved together gracefully and quickly cover any lapse of time or distance. Choppy breaks are eliminated and interest is held.

(Continued on Page 114)

Direct-16mm. vs 35mm. for Training Film Production

By WILLIAM A. PALMER

As has been the case with business and educational films in the last few years of peacetime, the showing of training films is almost entirely on 16mm. projection equipment. At least as far as training films for war industry is concerned, it would be hard to find 35mm. projection equipment in use. The Army and Navy in some of their more permanent posts are still using the theatrical-size film, but all have 16mm. equipment as well. All the outlying posts and bases are now using the 16mm. projection equipment for their training films as well as entertainment features.

The production of these training films by the Army and Navy, and by private concerns under contract to government agencies, is now almost entirely on 35mm. film. To many who have seen the excellent results obtained by producers of "direct-16mm." industrial films, it may seem strange that more production isn't undertaken in the medium in which the release is made—direct 16mm. Why shouldn't the various government agencies take advantage of the economies and simplicity of direct-16mm. production? Or are there any economies and simplicities in direct-16mm. production?

If one were to sit down and make a theoretical comparison of the two methods of training film production, weighing the costs, problems, and quality of results of one method against that of the other, the conclusions, I believe, would be that direct-16mm. is the proper medium. But this is no time for theoretical considerations. Like the military demands of the war itself, the demand for quantity production of visual aids to military, naval, and war industry training came suddenly, leaving no time for figuring an over-all procedure. The immediate needs after December 7 were for hundreds of films in the shortest possible time.

When the war broke there were three main groups who were able to start on a large scale training film program: the Army Signal Corps, the Hollywood theatrical producers, and the large industrial film producers. All three of these groups were completely geared to 35mm. production and had personnel acclimated to that medium. So they immediately went ahead with full speed, producing tremendous numbers of training films with excellent technical quality, reasonable cost, considering their value to the war preparations, and in general with the subject matter well handled.

If this has been the case, one might be prompted to say, why bring up 16mm. production? Isn't everyone concerned perfectly satisfied with the present 35mm. systems?

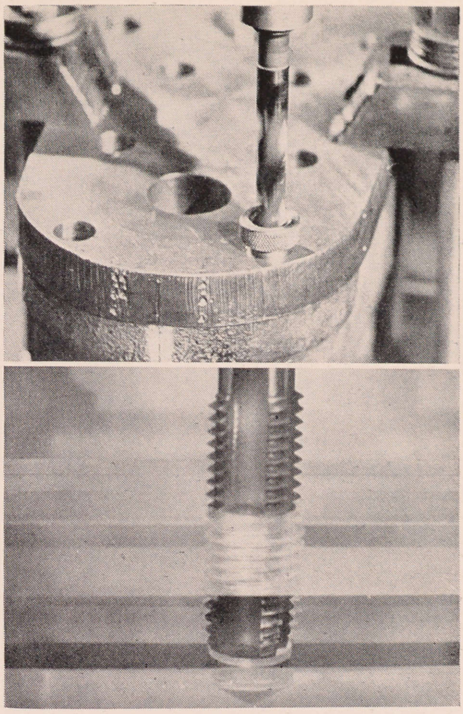
The answer to this is that the need is for many more training films, made much faster and under conditions where the lighter, fast-operating 16mm. equipment really shines. There is also the most important fact that 16mm. production has one ace-up-the-sleeve which can make all 35mm. abilities look in vain for a trump. That ace is Kodachrome.

Well, how important is color in a training film? *I believe color is all-important regardless of the subject.* I believe that color alone can add enough, giving a clearer visual impression, to make it more important even than the sound-track which is now considered indispensable.

Having thus stuck my neck out, I would like to explain more completely what I consider to be a good training film, and then maybe I can support my unqualified endorsement of color.

I believe a good training film to be primarily a *visual* aid to teaching some skill or operation. I don't think any training film made can be so good as to render unnecessary other more conventional methods of teaching, although I am aware of the experiments which have shown that educational films alone can do a better job on many subjects than can a teacher without visual aids. The great value in the training motion picture at the present time is that it can make up for the inability of available teachers to cope with the gigantic mass needs of war conditions.

The basic criticism that I have had to find with most of the training films I have reviewed is that they have been designed to cover too much or do too complete a teaching job by themselves. Their makers have considered that both the visual side and the sound-track had to be as complete as possible. I agree that the picture should be as complete as possible, but it has seemed to me that in many cases the sound-track has been so full of boiled-down information, even though well organized and presented, that it competes with, rather than aids the visual side. Since the visual side of a talking picture is the most vivid, the mind is apt to discard information given audibly, which does not apply *directly and immediately* to the scene being shown. Time and again I have seen supplementary information put in a sound-track of an advertising film simply fail to register with the audience; and I think the same holds true with a training film.



Instructional films like these gain added value from the color-separation by which Kodachrome gives an added dimension of realism.

It is this that convinces me that a training film must have every consideration given to the clearest visual presentation possible, and that all other factors—sound-track, film effects, smooth technical work, and even cost are secondary.

Here is where I believe the case for 16mm. production can be sold. In 16mm. Kodachrome and dupes therefrom, we have a color process rivalling anything in 35mm., and at reasonable costs in terms of both money and equipment. The only comparable color process, Technicolor, being prohibitive in cost even if equipment were available in sufficient quantity.

The presentation of subjects in Kodachrome is so much more natural than in black-and-white that to me there should be no hesitation in its use. By the use of color, many things can be shown that would be very difficult in black-and-white, even in subjects which at first would be considered to have no color possibilities.

To illustrate, we might consider a training film on lathe practice, several of which have been already produced in 35mm. black-and-white. In order to show clearly the operations, extreme close-ups must be used, and because parts of the lathe, as well as the work being turned out, are metallic and more or less shiny, it is very difficult to avoid confusing lights and shadows with the type of lighting demanded by good black-and-white photography.

The same film in Kodachrome would separate the grey shiny enameled parts of the lathe from the work being turned by color contrasts, which could be made extreme by using yellow brass for the

(Continued on Page 112)

Aces of the Camera XXVI:

Robert De Grasse, A.S.C.

By WALTER BLANCHARD

DIRECTOR of Photography Robert De Grasse, A.S.C., was practically born into the picture business—but it took a war to make him aware that the career he wanted was one behind a motion picture camera! Four of his father's brothers were stage or film folk. One of them—his uncle Joseph De Grasse—was one of the most prominent and best-liked of silent-picture directors. Another—Sam De Grasse—was one of the foremost screen "heavies" of twenty-five years ago.

But young Bob, though he grew up in a theatrical atmosphere, never paid much attention to the movies. He was much more interested in basketball; and America's entrance into World War I found him a student at the University of Southern California, studying occasionally, playing basketball energetically, and in general having a pleasant, carefree life.

The war changed things for him, though. As soon as he was old enough to meet the age requirements, he enlisted and was accepted for Officer's Training in the Field Artillery of the U. S. Army. But the Armistice found him still in training, and with the need for officers gone, he was soon granted honorable discharge and returned to civil life.

After his Army experience, though, he found he wanted something with more serious purpose to it than the life of a conventional collegian. So he decided to forget college and go to work. As a starter, he hit his Uncle Joe for a movie job. What kind did he want—? That was easy: he had decided that he wanted to get into camerawork, and work his way up to where eventually, as a First Cameraman, he could be responsible for bringing feature films to the screen. And in due time he found himself on Universal's payroll as an assistant cameraman.

This work suited him perfectly. There was endless variety in it, coupled with a purposefulness he could see as the picture progressed from the start to the finish of its shooting.

Besides, the comparatively easy-going production methods of twenty-five years ago gave him plenty of time to devote to his first love—basketball. He played on studio and semi-pro teams with distinction. One year his team even proved strong enough to be sent to the National Championship Tournament, in which it captured third place—the first team from the Pacific Coast to place so high nationally.

"I guess I felt pretty good about that," he says, "and I must have showed it. At any rate, my folks decided it was time to deflate me a bit. They began dropping hints that while they saw my name often enough in the sports pages in connection with basketball, they hadn't noticed anybody writing about my skill as a photographer.

"As those hints began to penetrate my consciousness, I suddenly made the discovery that there were a lot of things going on in the studio, and more or less directly related to the work I was doing, but about which I didn't know anything. I decided that if I wanted to get ahead in the business, I'd better forget basketball and begin learning about my own work!

"For instance, while I loaded and unloaded the camera, and took the exposed film to the laboratory every night, I realized I didn't know a thing about what happened to that film between the time it reached the lab and the time the rushes hit the screen the next day. So I began to put in my spare time helping the laboratory crews who developed and printed my film. I learned not only what they did, but how and why they developed and printed the scenes as they did.

"Next, I realized that a whole succession of interesting things must be happening in the cutting rooms where the disconnected scenes we shot on the set were assembled into a smooth-running continuity. So I made it a point to get acquainted with the cutters, and put in as much of my spare time as I could helping them. I learned how to cut film—not just how to splice it, but how to build the scenes and angles into

(Continued on Page 110)

THROUGH the EDITOR'S FINDER

DURING the past month a little group of publicity-seeking Senators have been sniping at the men from Hollywood who are serving as officers of the U. S. Army Signal Corps. From their viewpoint, this is probably understandable, for any attack on Hollywood and its prominent personalities is automatically good for Page 1 publicity for the attacker. But from any standpoint of logic or of common decency it is damnably unfair—especially when they charge that men who have been proving their ability and courage under fire are not worthy of the uniforms they wear.

Let's examine the facts. Long before Pearl Harbor, the Army knew it needed training films in greater quantity and quicker than its own scanty peacetime facilities could produce them. It knew, too, that when war eventuated, it would also need motion pictures of actual combat, made both for strictly military reference purposes and as documentary reports for the public at large.

To meet these needs, the Army very logically turned to America's motion picture industry and its people. The industry responded by turning out hundreds of Army training films—some of them of more than feature length—on a rock-bottom, less-than-cost basis. No charges were made for studio overhead or any of a score of other similar items which would be figured in any normal, commercial cost-accounting. The industry's best and highest-salaried executives, writers, directors, actors and other creators vied for the privilege of donating their services to the production of these films. In a word, the motion picture industry is the only industry in America which from the start—nearly two years before Pearl Harbor—deliberately arranged its government contracts so that it would not and could not make a penny of profit on its defnese production!

For combat films and tactical or training films which had necessarily to be made within the Army organization, Hollywood bled itself white to provide its best manpower. Executives, directors, writers and technicians voluntarily gave up the comforts of home and abundant salaries to step into uniform. The great majority of them, by reason of age or dependencies, did not really *have* to go—but they went, and asked for assignment to duty in combat areas.

The Army rewarded most of them with commissions, it is true: but these commissions are not so much a reward as the only possible means of giving these men the minimum military authority necessary to enable them to carry out their picture-making assignments. And whether these men were producers, directors, writers or cinematographers, the authority implied by their military commissions is in no case commensurate with the authority to which they were accustomed in their civilian positions.

Let's take the case of the individual most prominently—and most unwarrantedly—attacked: Colonel Darryl F. Zanuck. In civil life, he was the production head of the 20th Century-Fox Studio, with authority and responsibilities which can best be likened to those of a Major General in the Army. On the basis of proven performance, rather than politics or "pull," he stood unquestionably at the head of his profession.

For nearly a year before Pearl Harbor, and for many months thereafter, he was the guiding and coordinating spirit of the industry's Army training film production effort. In this he worked tirelessly: his days, he gave to his exacting studio job; but night after night, during the hours when most men are at home with their families enjoying well-earned rest, he remained at the studio, personally supervising the editing of Army training films, and the planning of new ones.

When he was finally called to active Army service, he was commissioned as a Lieutenant Colonel. He did not have to go. He was well past the selective service age limit. He was the father of three children. And he had served with distinction as a member of the 163rd Division of the A.E.F. in France during World War I.

But he volunteered and went—giving up, in the process, a brilliant career and a salary of more than $5,000 per week.

Going into active service, he did not ask for an easy desk job in Washington or Hollywood. He requested active service. And in the few short months since he was called into active service, he has seen dangerously active service on three fighting fronts. His first assignment took him to Alaska and the Aleutians, where he flew over Jap-held Kiska on reconnaissance for the Signal Corps. His next assignment took him to England, where he took commando training and participated in at least one hard-fought Commando raid.

His latest assignment took him to North Africa, where he participated in both the preparation and the actual land fighting of the invasion, filming a complete motion picture record of this major American military campaign. Where his next assignment may be, no one can tell: but anyone who knew or worked with him in Hollywood can tell you that if he has anything to say about it, it will be wherever there's the hardest and most dangerous work to be done. And the pictures he brings back, like his African invasion film which is shortly to be released (and not through his company, by the way!) will, we are sure, vindicate him in the eyes of the American public.

We haven't cited Col. Zanuck's record because of his erstwhile position in the industry, but because he has been the one most spectacularly attacked ,and because we believe his record is typical of those of the hundreds of trained picture-makers Hollywood has given to the Army. There may be some military misfits and pink-tea officers who have given Hollywood as their home address—that's always likely when swift and tremendous military expansion is taking place. But we don't believe Senator Truman or anyone else can put the finger on *one* man from Hollywood's film industry whose peacetime achievements indicated he had anything on the ball, who isn't more than pulling his weight in the Service.

For to us, Hollywood's attitude is typified by the remarks of one cameraman who came to see us shortly after Pearl Harbor. "Hell," he said, "I'm not worrying about a commission. I was an officer in the last war, but I'd be willing to go in as a buck private in this one. I don't want an easy, desk job: what I want is a chance to take my coat off and work hard making pictures. Rank or swank don't interest me—but I want a chance to put whatever skill I have to work for my country!"

•

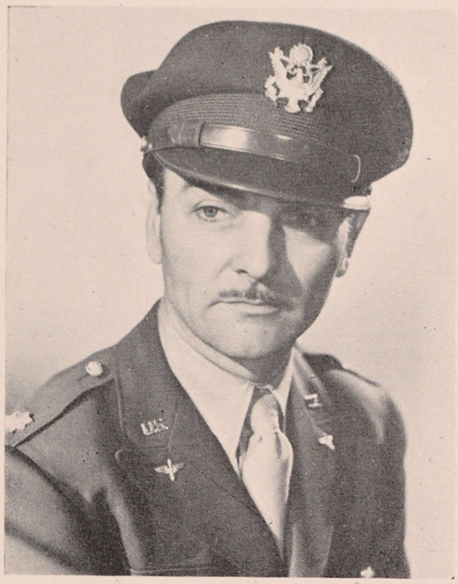
RANKING high among the industry's unsung heroes are the contact-men of the various raw film organizations. Ostensibly, their jobs are to promote the sale of their firm's product to the studios, to run down technical complaints and to keep the industry's cameramen up to the minute on the technical performance of their film.

But unofficially, their service to the industry and to the camera profession far exceeds this. Without exception they act as professional counsellors and friends to the men of the camera. They act as unpaid publicists and business agents for cinematographers—especially for those who may be out of a job or "between pictures." Times without number they have gotten jobs for cinematographers—often for men who didn't even know they had such friends plugging for them behind the scenes.

Any one of them has alone done more for cameramen than all the agents and "artist's representatives" who ever attempted to get jobs for cinematographers. Repeatedly they'll go to executives and camera chiefs and tell them frankly they're making a grave mistake in letting this man get away from them, or not hiring that one. And these executives accept the film salesman's word because they know he has no axe to grind. He gets no ten per cent from the man he "sells" to a studio; no gift or salary cut-back—often not even a word of thanks.

It seems to us that it's about time these men received some tangible expression of the camera profession's appreciation of their untiring service to the interests of cameramen, both individually and collectively. The war has honors for those who give service "above and beyond the call of duty." We who benefit by it should give honor, too, to these men give cinematographers that same sort of service above and beyond the strict letter of their jobs as film-salesmen.

A.S.C. on Parade



Now it's **Major Ted Tetzlaff, A.S.C., U.S.A.A.F.** Right in the middle of putting RKO's "Free For All" on film, the Army Air Force pinned a pair of gold maple-leaves on his shoulders and put him into training for active foreign service. Meanwhile, **Frank Redman, A.S.C.,** took over the completion of **Major Ted's** picture, and, so we hear, has everyone at RKO doing raves over the swell job he's doing.

★

From the "hot corner" of the South Pacific comes word that **Lt. Phil Chancellor, A.S.C., U.S.N.R.,** has received a well-earned promotion and is now **Lieutenant Commander Chancellor,** Photographic Officer on the Staff of the Commander of Aircraft in that busy area.

★

And **Winton Hoch, A.S.C.,** is now in uniform as a Senior Lieutenant in the U. S. Navy.

★

Among uniformed visitors of February was **Capt. Wilfrid M. Cline, A.S.C., U.S.A.A.F.,** in town briefly from parts unknown, en route to more of the same.

★

Another visitor was our Washington representative, **Reed N. Haythorne, A.S.C.,** out here on a Government camera assignment.

★

Add military "hush-hush" notes—**Roy Hunt, A.S.C.,** away from Hollywood on a special mission for the Army which, according to Army announcement, is "outside the continental U. S. A."

★

And **Bert Glennon, A.S.C.,** draws the prize plum of Technicoloring Irving Berlin's "This Is The Army" for Warner Bros., on a new contract that will keep him there for some time to come.

★

Shed a tear for **A.S.C.-Prexy. Fred Jackman:** his ration board let him get a brand new Buick and gave him a "C" card—and then **Fred** got laid up with intestinal flu and couldn't use either of them!

★

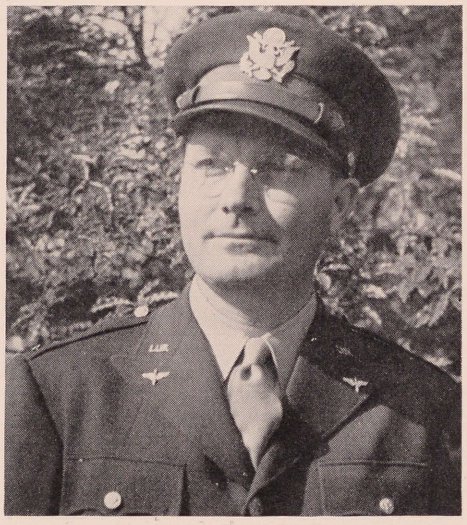
With three days of shooting left to finish "Old Acquaintance," **Sol Polito, A.S.C.,** had the bad luck to tumble off a camera-parallel and break his ankle. So **Arthur Edeson, A.S.C.,** stepped into the breach to finish the picture. Here's wishing **Sol** a speedy recovery!

★

The other day on the Warner lot we were startled by a lusty hail from a block away. Turned out' twas **Capt. Joe Valentine, A.S.C.,** of the Army's Special Service Corps, blowing off steam because we had reported him as a mere 1st Lieut. Don't blame us, **Joe**—that's the way we got it from the studio and the trade papers! And remember your promise to send us up a picture of you and those two nifty shoulder-bars to convince the other readers of this page!

★

L. Wm. O'Connell, A.S.C.—"Connie," to you — busy at Columbia filming "Blondie Buys a Horse."



It's **1st Lieutenant Tom Tutwiler, A.S.C.,** now. He's another good man grabbed by the Army Air Force. Lot's o' luck, **Tom.** We'll miss you!

★

Ernest Haller, A.S.C., gets the Director of Photography assignment on Warner's biggie, "Saratoga Trunk."

★

Congratulations to **Ralph Staub, A.S.C.** Just recovered from a serious siege of pneumonia, he started his 11th year with Columbia, turning out his "Screen Snapshots."

★

John Seitz, A.S.C., bedded by "flu," so **Theodor Sparkuhl, A.S.C.,** pinch-hit for him filming Paramount's "Five Graves to Cairo."

As we go to press, **Elmer G. Dyer, A.S.C.,** was just about to be sworn in as a Major in the Army Air Force. Those wings, he tells us, indicate he's the camera-toting member of the flying crew. Pretty nifty, what? No wonder he's beaming.

★

Out at Universal, **Paul Ivano, A.S.C.,** is assigned to film "You Go To My Heart."

★

We don't know if it's true, but one of the town's better columnists tells this one about **Lt. Charles W. Herbert, A.S.C.** Last year, when **Herb** went into the Army he decided to sell his photographic equipment, as he certainly wouldn't be using it "for duration." When he got his assignment to active camera-duty, the Signal Corps issued him—you guessed it!—his own camera!

★

Out at MGM, **Lester White, A.S.C.,** and **Hal Rosson, A.S.C.,** both smiling over new contracts.

★

And at 20th-Fox, Camera Chief **Dan Clark A.S.C.,** and **Eddie Snyder, A.S.C.,** have been anchored for another year via the contract route.

★

George Robinson, A.S.C., is head of the photography department of Universal's "School for Jive."

★

Russian notes: Out at MGM **Harry Stradling, A.S.C.,** gets the nod to put the Ratoff-Pasternak epic, "Russia," on film, while for Sam Goldwyn, **Jimmie Howe, A.S.C.,** is assigned to another Russky Kino, "North Star." After that, we hear, **Jimmie** is due to report back to Warner's on a new term contract—unless an important Government assignment "breaks" first.

★

Russell Metty, A.S.C., busy at RKO filming "The Sky's the Limit," with Fred Astaire and Joan Leslie.

PHOTOGRAPHY OF THE MONTH

THE HUMAN COMEDY

Metro-Goldwyn-Mayer Production.

Director of Photography: **Harry Stradling, A.S.C.**

This picturization of William Saroyan's much-discussed story must inevitably go down as one of the really great pictures of all time. In every phase it has the simplicity and moving power of true greatness. There is not a scene nor an action which does not ring true, to bring to the screen the most sincere and realistic presentation of the real America that we have ever seen.

This applies just as much to Harry Stradling's photography as to the rest of the picture. He contributes enormously to the production: his camera-treatment maintains a superb balance between documentary realism and a subtly "different" treatment in lighting and composition which enhance the dramatic values of the story without ever for a moment becoming obviously theatrical. Without doubt, it is his greatest camera achievement so far.

We could fill countless pages expressing our enthusiasm for this picture and its photography—but it would all add up to urging every reader, and especially those in foreign countries, to see this picture for themselves, for it is the finest picturization of American life and ideals ever screened. If you miss it, you will regret it, for "The Human Comedy" it not only a great picture, but a great emotional experience.

HANGMEN ALSO DIE!

Arnold Pressburger Production; United Artists' Release.

Director of Photography: **James Wong Howe, A.S.C.**

This melodramatic picturization of the Czech "underground" movement is unusually good entertainment, for in addition to its timely anti-Nazi theme, it is a more than ordinarily good melodrama. Both the story and the direction of camera-wise Fritz Lang have afforded James Wong Howe, A.S.C., unusually fine opportunities for photographic effectiveness. His treatment is throughout a study in the dramatic use of composition and effect-lightings. In only one sequence can we find any serious criticism with his treatment: this is in the sequence in the cafe where Anna Lee starts the cleverly-motivated movement to entrap Gene Lockhart. In the scenes where she and the waiter approach Lockhart, the composition in both long and medium-shots is seriously weakened by the inclusion at the right of the frame of the face of an extra girl which consistently distracts attention from the action of the principals.

For the rest, "Hangmen Also Die!" is well worth seeing as an example of fine melodramatic cinematograhy and for its interesting plot construction and presentation.

IN WHICH WE SERVE

United Artists' Release.

Director of Photography: **Ronald Neame, A.C.T.**

Noel Coward's picturization of the career of a British destroyer and its crew is another outstanding example of fine craftsmanship. Produced in England under wartime difficulties, it reflects endless credit upon all concerned. The photography by Ronald Neame, one of Britain's foremost cinematographers, is one of the finest pieces of camerawork ever to come out of England. It shows clearly how capably, and in what fine spirit our fellow-cinematographers of Britain's A.C.T. are carrying on. It is unfortunate that space limitations forbid a more detailed review of this exceptionally fine production, but we can sum it up by saying that we sincerely congratulate Cinematographer Neame and Producer-Director Coward on making one of the year's outstanding films, and one which we urge all our readers to see.

THE AMAZING MRS. HOLLIDAY

Universal Production.

Director of Photgraphy: **Elwood Bredell, A.S.C.**

When the difficulties which attended the making of this production are taken into consideration—it was off again and on again four or five times, while directors were changed, story rewritten, etc. — it must be concluded that "Woody" Bredell, A.S.C., has done a most creditable job of camerawork. It is not easy to turn out a smoothly consistent piece of cinematography when there are intervals of days and even weeks between spurts of shooting, during which story concepts and treatment are basically changed around. But Bredell has managed it with really surprising success. He gives the picture the required opulent visual mounting, and deals very well by the players, including the now completely grown-up star. Here and there can be seen traces of his difficulties—a sequence here which might have been better photographed in a higher key, a scene or two there which appears to have been printed down to the detriment of flesh values—but in general Bredell's skill and adaptability have brought him most successfully through what must have been a very trying assignment.

THE IMMORTAL SERGEANT

20th Century-Fox Production.

Director of Photography: **Arthur Miller, A.S.C.**

When they handed Arthur Miller the task of photographing "The Immortal Sergeant," they handed him an unusually difficult assignment. There are really two stories, which require diametrically opposite camera-treatment, but which are intercut as one—the story of Henry Fonda's pre-war life—is told in flashback form. On the one hand, these pre-war sequences called for sparkling, high-key camerawork; on the other, the basic story of a British patrol lost in the Libyan desert, calls for day exteriors of ruggedly documentary quality and a preponderance of virile night-effects. The way Miller has managed to blend these two conflicting elements into a coherent and comparatively smooth production is as great an evidence of his technical and artistic skill as anything he has ever done, not excluding his Academy Award achievement of last year.

THEY GOT ME COVERED

Samuel Goldwyn Production; RKO Release.

Director of Photography: **Rudy Maté, A.S.C.**

Special Photographic Effects by **Ray Binger, A.S.C.**

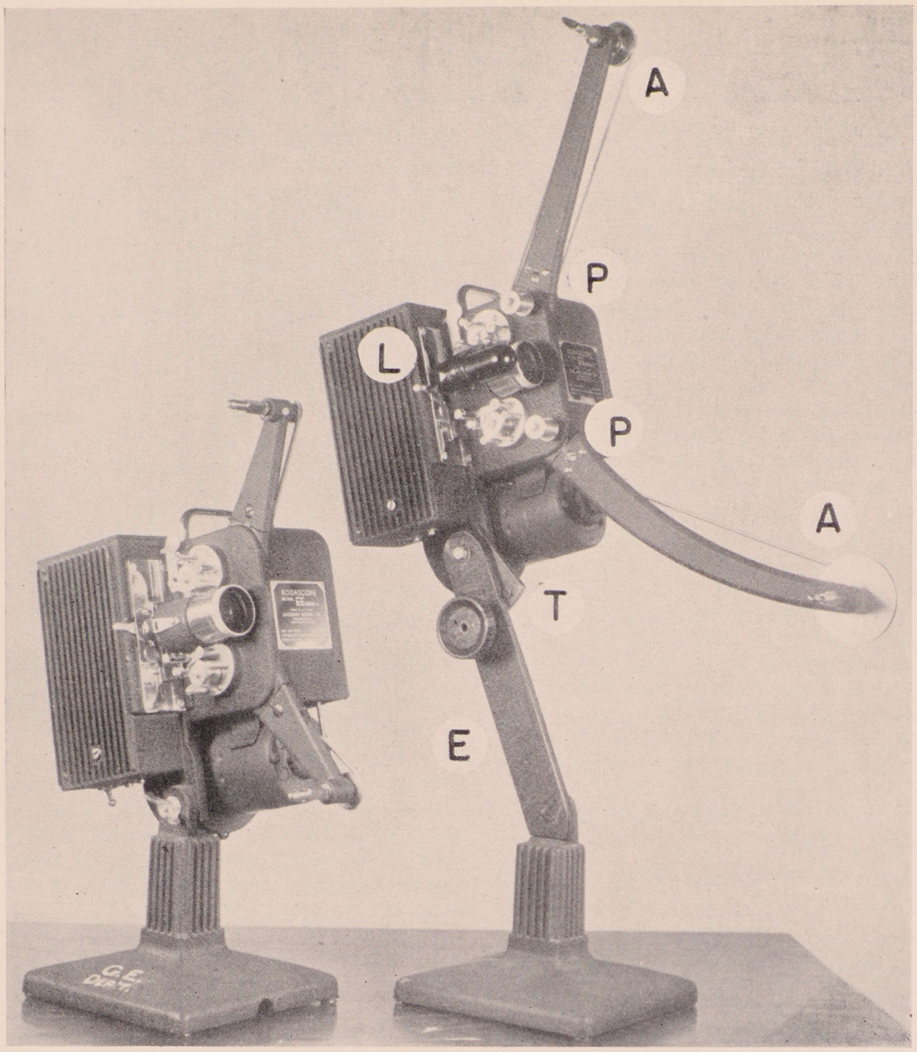
The mixture of typical Bob Hope ad-libbed comedy with a melodramatic story in this picture gave Director of Photography Rudy Maté, A.S.C., a really difficult assignment, but he has delivered his customarily fine performance at the camera. He keeps his players looking unusually well; especially Dorothy Lamour, whose appearance in this picture impressed me as being far better than in any black-and-white production in which she has appeared in a long time. Maté's effect-lightings are well worth study, among them the sequence in the abandoned factory which, instead of a studio set, employed as a background a bona-fide abandoned gas-works. Art Director Perry Ferguson's contribution is another interesting phase of the picture, especially the way he and Maté have given the film so much "production value" in spite of the current restrictions on set-construction. Ray Binger's special-effects work is another contribution which comes in for more than ordinary praise.

STRANGER IN TOWN

Metro-Goldwyn-Mayer Production.

Director of Photography: **Sid Wagner, A.S.C.**

This unpretentious little program production offers more charm and entertainment than many an "A" production we could mention. Sid Wagner's camerawork smoothly complements the rest of the production. His interiors are excellently handled, and his exteriors models of fine outdoor camerawork, while he presents his players to unusually good advantage. This, by the way, is particularly true of his treatment of Frank Morgan and Porter Hall, the latter appearing to better photographic advantage than we've ever seen him. All told, this picture is one we can recommend both as photography and entertainment.



A "Model EE" Grows Up

By PHILIP A. JACOBSEN

Technical and Research Director,
Campus Studios, University of Washington

NECESSITY is a good stepmother to Invention. She encourages honesty and does not bother with superficial refinements. She is not afraid of hard times and rough going. Necessity's adopted son seldom picks his haberdashery from Esquire and practically never rides in luxury, but those who know him best say that his home-made get-up belies his unusual performance and that the roads he travels with his "haywire old busses" and strange new rigs often get him there ahead of schedule. Hard-working and frugal Necessity is not much like the romantic, generous and easy going mother who bore most of today's crop of young movie-men but she *is* respectable and determined, and she has no intention whatsoever of abandoning her role as stepmother while it takes an AA-5 priority or better to put photoflood light in dark places. If your dreams of 16mm. sync-motor driven cameras, dual-system recorders, Moviolas, batteries of film phonographs and lockers overflowing with "Number 4's" and Kodachrome are suddenly interrupted by this strange woman calling you to breakfast in your war-stricken kitchen, you had better be nice and call her "Mama".

I started calling Old Lady Necessity "Mother" in 1937 and she has been the recognized head of my family ever since. In that year my plans called for sound-on-film by 1938 at the very latest. In 1938 I postponed the "sound-where-it-belongs" business until 1939. In 1939 I started shooting some backgrounds for the great sound-on-film job but put off the lip-sync stuff until 1940. In 1940 I rewrote the entire script, eliminating all sync sound, photographed everything "silent" on color ribbon but saved the post film recording for 1941. In '41 I recorded the sound on disk.

In 1941, Necessity, working overtime, figured out a way of getting our Eastman Model EE into long pants. The scheme called for man-size 1,600-foot arms, a stilt to keep the new reel-holders off the deck, a threading light, a fancy go-stop switch, a new speed control, and a flashy neon speedometer.

Our studio technician mutinied at the thought of mutilating a perfectly good projector in order to get parts enough to assemble an overgrown orphan, but we lured him back into the shop by rashly declaring that the hospital bill would be less than thirty dollars, and that since no manufacturer lists a machine with a stroboscope at any price, if he could do the trick he might get his name printed in THE AMERICAN CINEMATOGRAPHER.*

Building a couple of arms and spindles is not much of a trick for a man with a few good tools, and our duped mutineer would have turned them out in a few hours if someone hadn't stayed his hand in mid-air by pointing out that the reel arms on an "EE" are practically interchangeable with the 1,600-ft. arms on an Eastman FS-10.

Closer inspection convinced us that the longer belts on the 1,600-foot capacity FS-10 would also fit the rearmed "EE" without recourse to "jimmy", hack saw or torch. (In Fig. 1 the FS-10 arms grafted on our grown-up "EE" are lettered "A").

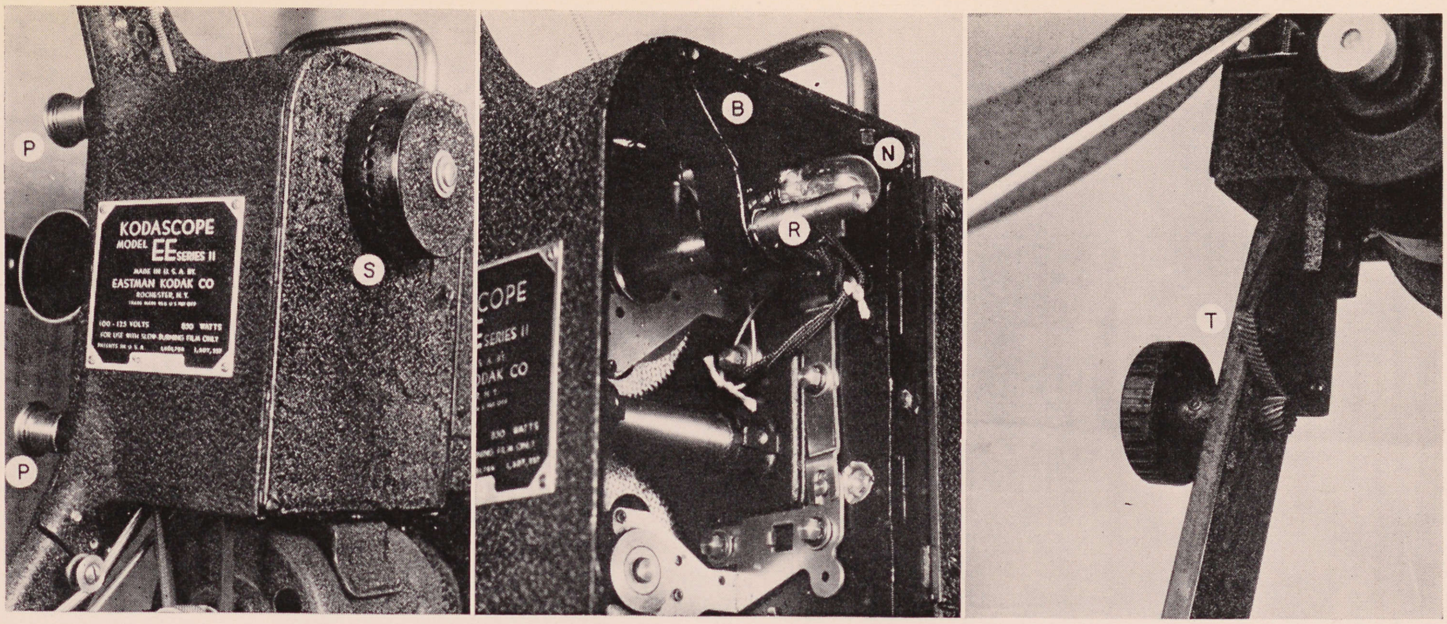
On top of this good fortune came the report that our purchasing agent had actually smiled when he found that he was not expected to buy a complete FS-10 to get each set of arms requisitioned, so we pressed our advantage by persuading him to buy new arms and belts for all the "EE's" on hand. For good measure we slipped in an order for several Eastman Model G threading lamp assemblies and start-stop-threading light switches. (In our photographs, "L" designates the threading lamp unit).

While we were about it we decided to do something about the speed-control resistor on the "EE". This control will completely stop the projector motor and cooling fan in its "all in" position *without* switching off the 750-watt light- and heat-giver. This makes things hot as hell in the lamp house and around the picture gate and makes even an operator dumb enough to stall the motor plenty mad.

We found that a fixed resistor of the right value in parallel with the variable control rheostat would prevent the motor from ever completely laying down on the job, but we happened to have a very nice Ward Leonard control with higher dissipation rating and just the right resistance, which could be installed without using brute force, and we couldn't resist using it. With this change

---

* Andrew B. Jacobsen (Now on RADAR research at M.I.T.).



On opposite page, the Model "E" in its original condition, and as rebuilt to take 1600-ft. reels. Above, the details of the conversion. P indicates idling rollers added to smooth feed and take-up with extended reel-arms; S indicates stroboscope drum; R, the extended shaft which revolves the "strobe," B, its bearing, and N the neon lamp which illuminates the stroboscope.

in speed-control resistance the "EE" couldn't be forced to run at any speed less than about eight frames per second.

To keep the 1,600-foot reels from dragging, it was found necessary to insert an extension bar between the base of the "EE" and the head of the projector. (This link is marked "E" in the photographs). The backward rake of the piece is just enough to put the weight of the vital parts where it will counterbalance the turning moment of a 1,600-foot reel when it is loaded to the gills. The fibre gear and brass pinion "T" with the associated handwheel were incorporated to make it easy to find the screen with the picture. The two rollers indicated by "P's" were installed after it was found that the film feed and take-up from the bigger reels was not smooth without a guide-snubber arrangement.

The final bit of surgery was undertaken in the interest of speed control accurate enough to give semi-synchronous operation with sound-on-disk. An abdominal was performed and the shaft mounting the upper sprocket wheel was removed and replaced with one long enough to stick through the plate covering the projector's inner vital organs. (In our operating-table photograph the new shaft is marked "R"). This same view shows a new bearing, "B," complete with oil-hole and well, which was installed to prevent shaft "R" from wandering.

Near this shaft, on a piece of bakelite, two terminal lugs were mounted to which a small neon lamp was directly soldered. Connections were then made from the neon lamp to the 110-volt circuit at a point where full voltage was applied to the lamp whenever the motor turned over. Next, a hole large enough to allow both the new shaft and the head of the neon lamp to protude was carved in the soft metal cover-plate.

Then a hollow cylinder with one end open was fashioned from thin tubing and sheet brass to form the stroboscope wheel. Forty holes were drilled in the face of the cylinder. We were told that this is just the right number to indicate when the Model EE is pulling film past the light gate at 24 frames per second. Some one with a degree in mathematics figured the new shaft would turn three revolutions per second when the machine was turning up sound speed. Since the sprocket mounted on this shaft sported eight teeth and three times eight is twenty-four, the figuring seemed about right.

Forty "strobo" holes per revolution times three revolutions per second was 120 "strobo" holes per second to us after a spell of thinking. Some one with a degree in electrical engineering helped us figure that a neon lamp sitting on a sixty-cycle source will flash on both peaks of each cycle which is the same as saying that it will get bright 120 times each second. This is just the way a neon light behind a 120 hole per second stroboscope should blink to make the "strobo's" spots stay put.

As I said we drilled forty evenly-spaced holes, but since all of our pictures are taken for sound speed projection we just never have been able to find time to put in an additional set of 27 holes in the cylinder to indicate 16 1/5 frames per second. It may be years before we can get our drill press to make us a set of 26 2/3 holes to signal exactly 16 frames per second.

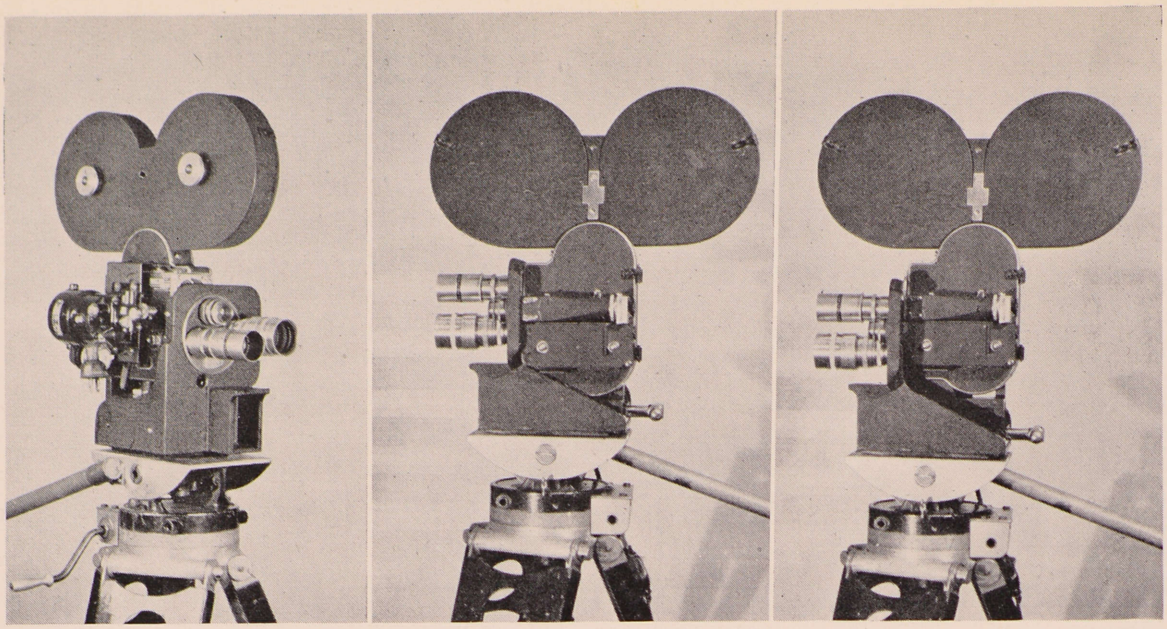
The outboard end of the new shaft was drilled and tapped for an 8-32 machine screw which, together with a pin, was made to hold the stroboscope cylinder in place. ("S" is for stroboscope in the illustrations). This finished the reconstruction and the masculated projector was christened, "Model EE Series J" by cracking a bottle of Kodascope oil over the oil holes. The launching was followed by a trial run with some of the crew holding their breath and some their noses.

To my great relief the reincarnated "EE" treated a 1,600-foot roll of film to as smooth a ride as a 16mm. picture can ever expect to get on any machine costing less than $1,200. In addition, the stroboscope proved to be such a good indicator of "out of bounds speed operation" that even lip-sync-sound-on-disk could be handled by a patient and attentive operator. Our success braced us for our next and most precarious step.

To keep the adult series J company on trips, we built a transcription player with a frieze of functional white spots running around the rim of its turntable and a neon flasher to chase these spots forward and backward when the platter turner wasn't rolling on the nose at 33 1/3 R.P.M. Before we finished everything necessary to force our cine-disk production on the audiences our public relations director was trapping, we had almost run out of days and nights tagged 1941. Finally, amid cat-calls and mud from both silent and sound-on-film armchair experts, and with some real misgiving on my part, we pushed the show and its gear out the alley door of the studio and onto the road.

Immediately that miserable "going to get fired" feeling enveloped us. We waited . . . for over a month, we waited. I packed my bag and waited . . . waited fully expecting a telegram from the unfortunate operator sent out with our "big mistake," telling us that he was closing the season with a special showing for his new schoolmates at the State Insane Asylum.

Instead, to my utter astonishment, we finally got an entirely different kind of a letter. It read: "Hello Gang. Maybe they won't padlock the studio. Surprise!! Your kaleidoscope of unintegrated color, message and transcribed sound, 'University' is getting by in the best of yokel circles with nary a slur on your necessity-mothered sound-on-disk. So easy to operate that I fell asleep during last night's show and didn't come to until the finish fade when some one turned on the house lights and the applause started." END.



Above, left, the "professionalized" Bolex; middle, camera in photographing position, and (right) in focusing position. Below, the camera in shooting position (above) and focusing position (below).

Professionalizing The Bolex

By WILLIAM STULL, A.S.C.

THE criticism most frequently levelled against most 16mm. cameras for either professional or advanced amateur use is that they do not provide for a professionally accurate method of ground glass focusing. One or two more or less custom-built "16-pro" designs, it is true, do provide this feature. But most of the better-grade 16mm. cameras of the types used by the majority of 16mm. professionals and advanced amateurs do not. They may provide ground glass focusing, but not with the lens in actual photographing position. Usually, the image is too small for precise work, and the focusing eyepiece unhandily located, as well.

But William A. Palmer of San Francisco, one of America's foremost exponents of professional 16mm., has recently remodelled a standard Bolex 16mm. camera to conform to standard 35mm. professional practice in this respect. Like a 35mm. studio camera, his professionalized Bolex has a handle-operated "throw-over" which moves the camera-head to one side and away from the lens and brings into place behind the lens a ground glass focusing screen with a suitable magnifying system which enables him to focus on an enlarged and laterally correct image while the lens is in actual photographing position.

In making this conversion, the original Bolex was left virtually unchanged. It can be removed from the device and restored to its original condition in a few minutes. Moreover, in making the conversion an absolute minimum of critical materials were used.

The foundation of Palmer's conversion is a shift-over mechanism he developed some years ago to eliminate parallax in the Bolex's usual visual focusing arrangement. This consists of a base on which the camera is mounted, and built up from two castings connected by a spring-tensioned cam-and-lever linkage. Originally this was used to drop the camera downward and to the left so that the lens, when rotated on the turret to bring it in front of the Bolex's visual focuser at the upper right-hand corner of the camera, occupied the same position it would when shooting. For photographing, the shift-over handle was given a half turn, lifting the camera up and to the right so that with the lens in front of the aperture, it would occupy the same position as in focusing, eliminating parallax worries.

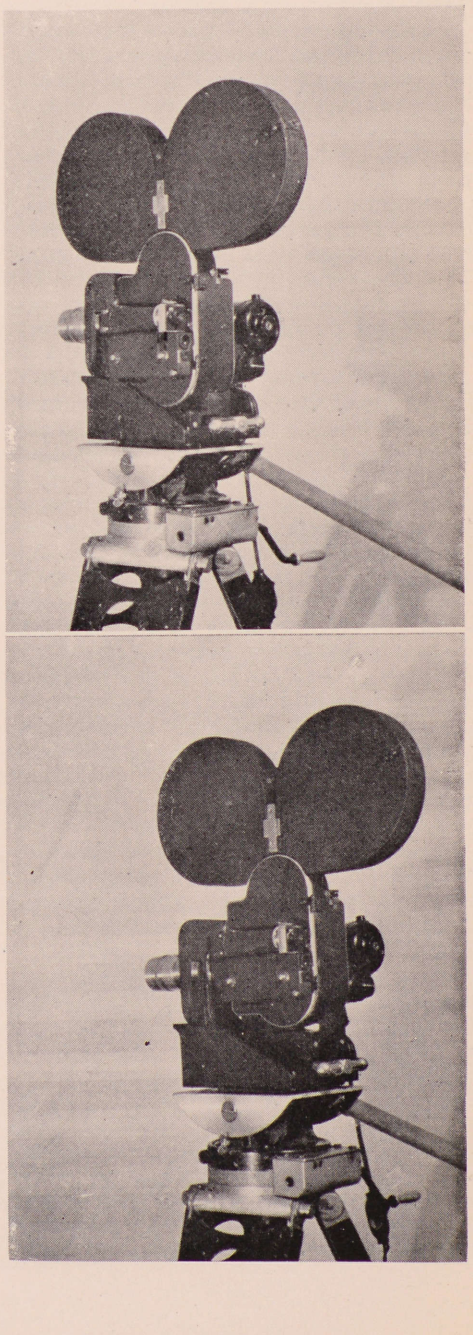
This in itself was an improvement, but it was by no means fully satisfactory, as the position of the camera's focusing eyepiece was inconvenient, and the magnification inadequate.

The next step was to make the design fully professional, providing a means for moving the camera out of the way and swinging a focusing system into place without moving the lens from shooting position.

The construction of the Bolex did much to simplify this. The Bolex happens to be one of the very few turret-equipped cameras in which the turret is not inset in the front-board of the camera. Instead, the turret is virtually a separate unit, mounted in front of the camera housing.

This made it possible to remove the

(Continued on Page 108)



IT'S UNANIMOUS!

PROFESSIONAL JUDGES
of
PROFESSIONAL PHOTOGRAPHY
have handed down their
sweeping decree in favor of

EASTMAN NEGATIVES —

NOMINATED for the Academy Award
for outstanding Photographic Achievement in 1942
ALL 10 Photographed with Eastman Negatives —

PICTURE	CAMERAMAN	STUDIO
King's Row	James Wong Howe	Warner Brothers
Magnificent Ambersons	Stanley Cortez	RKO (Mercury)
Moontide	Charles G. Clarke	20th Century Fox
Mrs. Miniver	Joseph Ruttenberg	Metro-Goldwyn-Mayer
Pride of the Yankees	Rudy Maté	Samuel Goldwyn Productions
Pied Piper	Eddie Cronjager	20th Century Fox
Take a Letter Darling	John Mescall	Paramount
Talk of the Town	Ted Tetzlaff	Columbia
Ten Gentlemen from West Point	Leon Shamroy	20th Century Fox
This Above All	Arthur Miller	20th Century Fox

Our Congratulations and Sincere Appreciation
to these honored and acknowledged Cinematographers

J. E. BRULATOUR, INC.

FORT LEE CHICAGO HOLLYWOOD

The Useful Hyperfocal

By JOSEPH WALKER, A.S.C.

HYPERFOCAL DISTANCES

Stop.	Focal Length of Lens.					
	12½mm.	15mm.	25mm.	1½-inch.	2-inch.	3-inch.
	Hyperfocal Distance in Feet.					
f: 1.8	11¼	16	46¼	104	185	417
2.5	8	11¼	33½	75	133	300
3.5	5¾	8	23¾	53½	95¼	214
4	5	7	20¾	46¾	83	187
4.5	4½	6¼	18½	41¾	74	167
5.6	3½	5	14¾	33½	60	134
6.3	3¼	4½	13½	29¾	53	119
8	2½	3½	10¾	23½	42	94
11	1¾	2½	7½	17	30	68
16	15½″	1¾	5¼	11¾	21	47

CORRECT focus is an absolute essential to good photography. In some types of amateur and documentary filming, minor errors in exposure, composition and lighting may at times be considered forgivable. But unless a scene is in good focus, it's of no use to either the professional or the amateur.

The professional cinematographer, of course, has a double check on his focus. First, he is able to study the actual image, right-side-up and highly magnified on a ground glass focusing screen. In addition, it is standard practice to measure the distance from camera to subject with a tape-measure before every shot, and set the lens accordingly.

But the amateur substandard cinematographer doesn't enjoy these advantages. Only a few 16mm. or 8mm. cameras permit any sort of ground glass focusing, and only a very few of these give the ground glass image magnification great enough and critical enough to permit absolutely precise focusing. Only a very few of the more careful-minded amateurs take the trouble to work, professional-wise, running a tape before each scene. And while an interconnected rangefinder would be invaluable in substandard camerawork, thus far only one amateur camera so equipped has appeared on the market. So focus remains headache No. 1 of home moviemaking.

To some extent, the extreme focal depth of the short-focus lenses generally used on 16mm. and 8mm. cameras can cover up minor errors in focusing. But not always—as most users of focusing-mount substandard cameras can testify from sad experience! And even in 8mm., a scene where you've guessed wrong in adjusting the lens of a focusing-mount camera is usually a good deal worse than what you'd have gotten under the same circumstances with a simpler, fixed-focus lens.

The answer is that the manufacturer of the cheaper, non-focusing lens has taken advantage of a very useful little optical fact and mounted the lens so that it is permanently focused at what is called its hyperfocal setting. You can make this same optical fact work even better if you have lenses in focusing mounts. Especially when you're working under pressure, making scenes of the "grab-it-quick" type, where you want to minimize fiddling with and thinking about basic camera mechanics, you can often set a lens at its hyperfocal setting and then forget focus, confident that (at least on most normal shots) everything important in your picture will be in adequately sharp focus. But to do this you've got to know what the hyperfocal distance is, and how to put it to work.

As a matter of fact, the hyperfocal distance is a double-action affair. First of all, it is the distance at and beyond which all objects are in focus when sharp focus is secured at infinity. But also—and perhaps more important—if you focus the lens *at* the hyperfocal distance, everything from one half that distance from the camera to infinity will be sharply defined. If, for instance, the hyperfocal distance were 25 feet, everything from that point on to infinity would be adequately sharp with the lens at infinity focus, while if the lens were placed at the hyperfocal setting of 25 feet, everything from 12½ feet to infinity would be adequately sharp.

The hyperfocal point is dependent upon three factors: the focal length of the lens, the aperture used (expressed as an *f*-stop) and the circle of confusion.

The term "circle of confusion" refers to the diameter of the lens' image of any given point in the subject. Theoretically, if lenses could be made perfect, the image of a point would also be a point. But in practice, not even the finest of lenses can bring the images of all wave-lengths or colors of light to a focus so precisely in the same plane that the image of a point will be a true point. Instead, some wave-lengths will come to a focus on the plane of the film, while others will be focused microscopically behind or in front of it, in either case giving an image on the film slightly larger than the actual point. The practical result is that the image of the point is reproduced as a circle, rather than as a point. Maybe it is microscopically small, but it is still mathematically measurable as a circle instead of a point.

The size of this circle of confusion therefore becomes one of the chief governing factors in the matter of image definition. Speaking generally, the finer a lens is, the smaller the diameter of its circle of confusion. In the same way, if a lens is to be used for work that is not too exacting, you can base your hyperfocal and depth of field calculations on a circle of confusion considerably larger than is necessary in a lens to be used for exacting work like cinematography. For still-camera work, for example, and even in some calculations for 35mm. cine work, a circle of confusion .002 inch in diameter may be quite acceptable; but for really professional 35mm. cinematography, and for all 16mm. and 8mm. cinematography (in which the relative enlargement in projection is much greater than in 35mm. practice) the permissible circle of confusion must be taken as .001 inch.

The accompanying table will give you the hyperfocal distances for the most commonly used substandard lenses over the general range of stops. But it is easy enough to figure out the hyperfocal point for any lens and stop for yourself. The formula is:

$$H = \frac{F^2}{f \times C}$$

In other words, the hyperfocal distance (H) equals the focal length of the lens (F) multiplied by itself and divided by the product of multiplying the *f*-stop (f) by the circle of confusion (C). You can see that for any one lens, two of these factors—focal length (F) and circle of confusion (C)—remain constant. The other two may vary, and therefore influence each other.

Now let's see how this works out in practice. Suppose we have a 2-inch lens and use it at *f*:2.5. Assuming the circle of confusion to be .001 inch, and substituting these numerical values into our formula, we have "H" equal to 2x2 divided by 2.5 x .001. This works down to 4 divided by .0025, and gives us 1600 inches or 133 feet. If the lens is focused at the 133-foot point, everything from a point about 65 feet from the lens to infinity will be sharp.

Now, let's stop the same lens down to

(Continued on Page 108)

AN OPEN LETTER TO ARTHUR EDESON, A.S.C. AND MICHAEL CURTIZ

KARL FREUND, A.S.C.
15024 DEVONSHIRE STREET
SAN FERNANDO, CALIFORNIA

Dear Arthur and Mike:

A few hours ago I came out of the theatre where I saw your picture "Casablanca." And I am writing this because I want you two to know how I feel about the very fine job you have done together. Since I saw the magnificent work Jimmie Howe did in "Transatlantic" twelve years ago, I have not seen a picture that so impressed me with its realization of what fine camerawork can mean to a production as did your joint achievement in "Casablanca."

Judged by the yardstick used to measure the enduringly great pictures of all time, "Casablanca" may or may not be what the critics would call a "great" picture. But it is fine entertainment. And it is a truly great example of fine film craftsmanship and of teamwork between the director and the director of photography. As one film craftsman to another, I want to offer my sincere congratulations to you both on this achievement.

Genuine cooperation and craftsmanship are things we see all too little of these days . . . particularly the sort of understanding cooperation between director and cinematographer which made "Casablanca" so effective visually. Too often the director seems to ignore the camera entirely, except as a machine for recording his scenes in the most literal way. Or else he may go to the other extreme and become so exaggeratedly conscious of the camera that he overloads his picture with "arty" tricks of focus and angles—copied, perhaps, from something he saw in somebody else's picture—which play no real part in advancing the story or in building up dramatic moods. All cameramen know that these jugglers' tricks are not good cinematography . . . but if his directorial partner shows so little understanding of the real meaning of his medium as to insist on filling his picture with out-of-place tricks, what can the poor cinematographer do but deliver them—and grow discouraged in the process?

To you, Mike, I want to express my admiration of an artist who knows the value of legitimately fine cinematography and who, as evidenced by what I saw on the screen not only in this picture but in all of your productions, is always willing to give his cinematographer a free hand to contribute it outstandingly to the benefit of the production.

To you Arthur, I want to express my admiration for having risen so magnificently to the opportunities Mike and "Casablanca" gave you, and turning in the crowning achievement of a long and distinguished career. For too many years you have been assigned to productions which did not give you any opportunity to demonstrate the skill your fellow-cinematographers know is yours. But when the opportunity came, your mastery of all the resources and subtleties of cinematography enhanced both the dramatic and the physical values of the production. I am sure that what I saw on the screen was put there much more by your skill in lighting and composition than by anything that existed actually on the set. Your picture unfortunately is not up for the Academy Award this year—but you can have mine any time you want it. An achievement like yours deserves the highest recognition your fellow cameramen can bestow.

I know you two were backed up by a fine and far-seeing studio organization, from producer Hal Wallis right on down the line. But if there had not been outstanding ability, understanding and cooperation on the set, I would not now be writing this letter. You may wonder why I am doing it, anyway, since I am at another studio, under a contract which still has four years to run.

The answer is simple: I feel that now, perhaps more than ever before, our industry, and the world at large, need fine pictures. Above all, we need the sort of understanding, sympathetic team-work between director and cinematographer of which your picture was such an outstanding example. In the old days, this sympathetic understanding between the two key men of production used to be general; but of late something—perhaps the perpetual rush to meet production schedules—has crowded it into the background of our daily work.

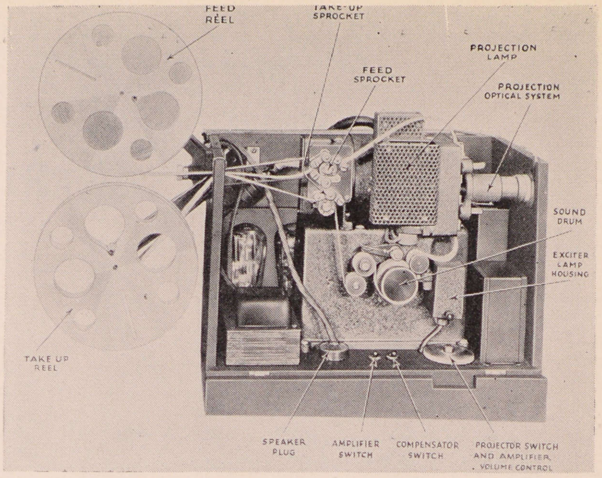
I am sure I speak the sentiments of all the industry's cameramen when I say that we of the camera profession look forward to the day when that type of cooperation and craftsmanship will again be the rule rather than the exception. But until that day comes, it is only fair that those who show us, as you and Mike have, what can be achieved when cameraman and director work together as an understanding and brilliantly cooperative team, should be given recognition of our heartfelt admiration and appreciation. And in addition, I want to extend my personal thanks to both of you for having given one camerman a thoroughly delightful evening.

Sincerely,
KARL FREUND, A.S.C.

(Advertisement)

Practical Pointers On 16mm. Sound Projection

By JOHN W. BOYLE, A.S.C.



Layout of a typical 16mm. sound projector. The detail arrangement of the components varies in different designs, but the essential parts indicated in the illustration can be found in all makes.

THE Editor tells me that quite a number of amateurs have written to THE AMERICAN CINEMATOGRAPHER lately, asking for advice on how to operate the 16mm. sound projectors they are called on to use in showing civil defense films or in helping put on U.S.O. shows for troops in their communities. They're thoroughly accustomed to operating 16mm. silent projectors, but sound, they feel, adds a new element which brings up unfamiliar complications.

Really, though, there are fewer of these complications than you might at first expect. Modern 16mm. sound projectors have been designed with an eye to simplified operation, and the sound reproducing part of the projector is almost as easily operated and as durable as your phonograph or radio. The details and arrangement of the various makes and models may differ slightly: but once you understand the basic principles of sound-film reproduction you'll find it easy to understand and operate any type of projector.

While the sound and the picture are printed on the same strip of film, they are not placed literally together. The picture must go through its projection aperture with an intermittent movement. The sound must go through its reproducing aperture with a continuous movement. So the sound which synchronizes with any given picture frame is printed on the edge of the film 25 frames ahead of the picture. That is, when the picture frame is in the aperture, its accompanying portion of sound-track is about 7½ inches below the picture aperture. The sound pick-up is located at a position such that when properly threaded through the various sprockets and idlers which give the film the properly smooth motion past the sound-head, there will almost automatically be just 25 frames of film between the picture and sound apertures.

The picture projecting mechanism, as a rule, will turn out to be an old friend. This component of the projector is usually identical with the same manufacturer's silent projectors, and can be threaded and operated in exactly the same way. If, as in one or two recent designs like the Eastman sound projectors, the entire projector is a new design not based on previous silent models, you will still find enough family resemblance so that the picture component is easily understood.

Only when you pass the lower driving sprocket do you find sound rearing its ugly head. From this sprocket the film makes a fairly taut loop around the drum at which the sound pick-up is located. From there, in most designs, it passes over another sprocket and through various guiding rollers and idlers to the take-up.

Probably the most important single factor in good sound reproduction is to have the film move past the sound-scanning aperture at a really smooth rate. For this reason, the sound pick-up is almost always located at a drum. This drum is not driven by the projector mechanism: it is revolved entirely by the friction of the film passing over it. In turn, the drum is attached to a fairly heavy flywheel or some other form of movement-smoothing "damper," so that once started, it tends to keep revolving at a smooth and uniform rate, and to keep the film's motion uniform, as well.

Therefore the tension of the film around the sound drum must be just exactly right. If it's too tight, it is likely not only to tear the sprockets, but to transfer to the film at the pick-up point a flutter or irregularity as the teeth of the driving sprockets catch in engaging and disengaging the film sprocket-holes. If it's too loose, you lose the value of the flywheel action, and the film may bulge forward off the flywheel, and out of the focus of the sound-scanning beam. The result in either case is bad sound quality.

The different manufacturers have devised different methods of getting this tension right. Some projectors use various systems of spring-tensioned idling rollers. Bell & Howell, in their Filmosound projectors, use an ingeniously simple mechanism they call the oscillatory stabilizer. It consists of two spring-tensioned rollers, one bearing on the film feeding onto the drum, the other on the film feeding off the drum, and both mounted at opposite ends of a single arm which pivots at its center. When the film tightens too much against one roller, this pivoted mount automatically slacks off the tension on the other roller, keeping the movement of the film surprisingly uniform.

In general, when you thread the film over the sound drum remember not to try to pull it too tight; just be sure it's in good contact with the drum, but not binding.

Anyway, most 16mm. sound projectors have pretty full instructions, including a complete threading diagram, either marked on the projector itself or prominently printed inside the projector's carrying-case or blimp. If you find you've got to operate an unfamiliar projector on short notice, a few minutes spent studying this chart should take all the mystery out of its operation.

Hooking up the wires for the sound part of the projector has also been simplified and made as nearly foolproof as possible. With some projectors, a single lead may serve to feed power to both the picture-projection mechanism and the amplifier; but in most designs there are separate power inputs for projector and amplifier. In some of them—like the Filmosound—a single power cable divides at the end into two female connections, which are plugged into adjacent inputs. As a rule, it doesn't matter which plug goes into which power input, so long as both receive current of the proper voltage and frequency.

In some sound projectors the amplifier is built as a separate unit; in others, it is built right into the base of the projector, or into its blimp. If the amplifier is separate, you will usually need a short cable to connect the amplifier to the sound pick-up. Otherwise, you won't, as the connection will be built-in.

Finally, there must be a cable connecting the amplifier with the loudspeaker which is of course placed "down front" near the screen.

These various outlets and inputs are always clearly labeled. And just in case someone might get careless about making these connections, most of the manufacturers have arranged their wiring so that the right plug can *only* be put into the right hole. For example, the line from projector to amplifier may have a four- or six-contact plug like the base of a radio tube, with one of the round contact prongs slightly larger than the rest, so that it will only fit into its correct hole, automatically aligning the other contacts correctly. The line from the amplifier to the speaker may have terminals with a different number of contacts, or perhaps a rectangular plug

(Continued on Page 106)

EIGHT
OUT OF TEN

OF the Ten Best Pictures, selected in the *Film Daily's* critics poll for 1942, eight were made on Eastman Negative Films. This gratifying result provides striking evidence of the strong preference for these high-quality films. Eastman Kodak Company, Rochester, N. Y.

J. E. BRULATOUR, INC., *Distributors*
Fort Lee Chicago Hollywood

PLUS-X
for general studio use

SUPER-XX
when little light is available

BACKGROUND-X
for backgrounds and general exterior work

EASTMAN NEGATIVE FILMS

AMONG THE MOVIE CLUBS

"New Horizon" for Metro

A "bang up" program of outstanding film fare, a discussion on continuity, and four examples of "editing with the camera" made the February meeting of the Metropolitan Motion Picture Club of New York an outstanding one. Film fare started off with "New Horizon," Randolph Clardy's famous 8mm. monochrome which won the Grand Prize in The American Cinematographer's International Amateur Movie Contest in 1936. This was followed by member Sidney Moritz' Kodachromed "Sternwheeler Odyssey," as a prelude to Moritz' discussion on continuity. Then followed four camera-edited 8mm. films from the New York 8mm. Club's uncut-film contest: 50 feet each from 8mm-ers Victor Ancona, K. Koehler, A. McGregor and E. Roeskin. The final feature of the excellent programme arranged by Joseph Hollywood was the new, Kodachromed version of "In The Beginning," by Fred C. Ells, one of 1942's best amateur films. Old-timers will remember that the original, black-and-white version of this picturization of creation, produced some year ago when Ells was living in Japan, won him international recognition as one of the world's foremost amateur filmers. The new version is interesting evidence of how much expertly-handled Kodachrome can add to a picture.

FRANK E. GUNNELL.

Los Angeles Clubs Double Up

Due to gasoline rationing and transportation difficulties in a sprawling city like Los Angeles, that city's two leading movie clubs—the Los Angeles Cinema Club and the Los Angeles 8mm. Club—have both decided to hold six meetings a year instead of twelve, meeting in alternate months and each inviting the other's membership to attend. The February meeting of the Los Angeles Cinema was therefore well attended by 8mm. members. The screen fare included "War Against Waste," an outstanding 16mm. sound-film documentary on industrial conservation produced by the Caterpillar Tractor Co., and shown by Editor Wm. Stull of The American Cinematographer. This was followed by "The Round-up," filmed by Guy Nelli; "An Office-girl's Reverie," by Jacques Shandler; "Yosemite," by Richard Orlow; "This Wonderland of Ours," by C. F. Lenhart; "Oregon-Columbia Road," by past-president William Hight; "Sequoia and Arrowhead," by E Pyle, and "Beyond Yosemite," by Paul Kassen.

ALICE CLAIRE HOFFMAN,
Secretary.

Prize Winners for 8-16

Highlights of the February meeting of the 8-16 Movie Club of Philadelphia were two prize-winning scenario films from the library of The American Cinematographer. These were "White North," and "Prize Winner," both of which had captured premiere honors in the Scenario-film division of that magazine's International Contests. The elaborate set-building and costuming of the first film, and the homespun naturalness of the second evoked much favorable comment.

GEORGE BURNWOOD.

Washington in Minneapolis

Washington was brought to Minneapolis for the February meeting of the Minneapolis Cine Club. The vehicle was the camera of member Russ Duncan, just returned from a long stay in the Capitol. He showed two films—"This Is America," and "Fire In Washington"—the result, so he says, of his long evenings and Sundays in Washington where, he claims, the days go twice as fast as anywhere else, and the nights and week-ends are twice as long as they are in Minneapolis.

ROME A. RIEBETH.

Varied Programs in Long Beach

The February 3rd meeting of the Long Beach (Calif.) Cinema Club had as its guest Jack Helstowski of the Whittier Cinema Club, who exhibited two films, "Trials of Life," and a chiller-diller, "Back From the Dead," both with sound made by a Presto synchronizer. Other films shown included "White Water," by C. A. Willis, of Merced, and three prize-winning films from The American Cinematographer's library. These were "Prize Winner," by J. Kinney Moore; "To the Ships of Sidney," by James A. Sherlock, of Australia, and Randolph Clardy's "Cattle Country."

The Club's work-meeting on February 17th was devoted to the first stages of putting together members' un-edited films. Story outlines were discussed for Robert Shoemaker's films of the harbor, and Claude Evans' pictures of Boulder Dam. Clarence Aldrich gave a demonstration of title-making, and Myrtle Adams and Mrs. Everley served refreshments.

LA NELLE FOSHOLT,
Publicity.

Title-Talk for Tri-City

A practical demonstration on titles and title-making by past-president Dr. Albert N. Mueller was the technical highlight of the February meeting of the Tri-City Cinema Club of Davenport, Ia., Rock Island and Moline, Ill. On the screen we saw "Adventure At Six," 200 ft. 8mm. Kodachrome, by Paul Severs; "Alaskan Highway," 400 ft. 16mm. Kodachrome, shown through the courtesy of Elmer Jansen, and "New York—the Wonder City," 1200 feet 16mm. Kodachrome, by Dr. Paul A. White. With the above, approximately 14 films by members have been shown before the Club this season. All of them are automatically entered in the Annual Contest, and represent the largest number the Club has had entered in any Contest to date.

WILLIS F. LATHROP,
Secy.-Treas.

Philadelphia's Contest

The Annual Contest of the Philadelphia Cinema Club was held at its February meeting. Many members of both the Norristown and the 8-16 Cinema Clubs were guests of the evening. Throughout the Club year each film shown by a member is given a rating by vote of the members present, and at the end of the season the six-highest-scoring films are shown in competition. Judged were former contest winners and members of the executive committee. The prize-winners this year were: First Prize, "Grand Manan," 16mm., by Robert Crowther; Second Prize, "New York Zoo," 8mm., by Dr. R. E. Haentze; Third Prize, "Roaring Through the Rockies," 16mm., by President George Pittman; Fourth Prize, "Colonial Williamsburg," 8mm., by James Maucher. Also shown was the runner-up, "On the Vineyard," by Charles James.

FRANCIS M. HIRST,
Publications.

V-Mail for San Francisco

Highlight of the February meeting of the Cinema Club of San Francisco was a demonstration-lecture on the "V-Mail" system by Director D. L. Redfield, illustrated by a short film prepared by the Eastman Kodak Co. He also showed Eastman's new "Cavalcade of Color." Leon Gagne showed his 1200-ft. Kodachrome picture "Lake County," showing this popular resort region at various seasons of the year. Matt Draghicevich showed a selection of photographic slides, and Past President John Smurr gave a talk on trick photography, which he has used to excellent advantage in several of his fine films, some of which he showed.

R. W. ARFSTEN,
President.

"Indian Summer" Southern Winner

"Indian Summer," a two-reel Kodachrome by Carl Anderson, with musical accompaniment, was the winner of the Annual Contest of the Southern Cinema Club, of South Gate, California.

The Club's officers for the coming year are Bill Fisher, President; Harold Robertson and Walter Cummins, Vice-Presidents; Enid Lindgren, Secretary, and C. C. Matheny, Treasurer.

RUTH FISHER,
Ex-Secretary.

B-M **16 m/m**

SOUND RECORDING SYSTEMS

J. A. MAURER
117 E. 24 ST. NEW YORK

16 mm Business Films

THE WAR AGAINST WASTE

Institutional-documentary; 800 feet 16mm. black-and-white.

Produced and presented by **The Caterpillar Tractor Co.**

Photography by **Frank H. Kirchner.**

Reduction-print and RCA 35mm. recording by **Chicago Film Laboratory.**

This picture is another of the Caterpillar organization's characteristically excellent institutional films, and one which should be seen by the staffs of all of America's war industries. There is virtually no institutional publicity plugging in this picture, which tells of the material conservation methods practiced in one of our country's great industrial establishments.

Cinematographer Kirchner's use of lighting, camera-angles, some moving-camera shots and cleverly-planned transitions makes "War Against Waste" an excellent example of modern industrial cinematography. He maintains the characteristic rapid-fire tempo which have distinguished all of his earlier pictures, yet at the same time brings home very graphically—and usually by visual means—the care taken in the Caterpillar plant to assure that waste of metals, packing-cartons, and even waste paper be cut to the absolute minimum. After seeing the film, one is inclined to look down on the Chicago meat-packers who traditionally admit that in packing pork, they waste the pig's squeal. You feel sure that the Caterpillar plant engineers would even salvage that!

The picture could, however, very well be divided into two shorter productions, as the first half of the present 800-ft. film deals with conservation of materials within the plant, and the second half forms a virtually complete picture dealing with conservation of Caterpillar products already in service, through salvaging worn or damaged parts by welding and similar repairs which only a short time ago would have called for complete replacements. Both parts are interesting, but it seems to us that as separate pictures, each could more actively serve its specialized audience.

The film was photographed in 35mm., including an unusual number of excellent camera dissolves and other optical effects. The reduction print of both sound and picture by the Chicago Film Laboratory is a top credit to this organization.

Sound Projection

(Continued from Page 102)

using four or six rectangular bars—one of which is at right angles to the others—instead of the round prongs. In other words, as long as you don't try to force a plug into an input that won't receive it, you've very little chance of going wrong.

Only remember that both the projector and the amplifier must receive current, and that a line must be established from the projector's sound pick-up to the amplifier, and from there to the loudspeaker, before the outfit will project sound!

Some sound projectors, too, have amplifiers made so they can handle two sound projectors, so that changeovers can be made professionally, without a break. In that event, you'll see the two inputs prominently labeled "Proj. 1," and "Proj. 2," and a switch similarly marked to control the changeover. Many of these amplifiers also have a couple of additional inputs—well labeled—for connecting a microphone or a disc turntable.

On some of the better 16mm. sound projectors there is likely to be an additional control located near the sound pick-up; it may be a little lever, or a sliding knob or button. It is sometimes labeled "Fidelity." Its purpose is to alter the focus of the sound-scanning optical system, so that regardless of whether you have a reduction print from 35mm., which has the emulsion facing the lens, or a dupe from a direct-16mm. original, in which the emulsion is usually away from the lens, the sound pick-up will always be sharply focused, and the sound quality clear.

The sound controls of most 16mm. sound-film outfits are no more complicated than those of your radio. You'll find an "off-and-on" main switch, a volume control, and a tone control. Sometimes there may be two volume controls—one for sound-film volume, and the other for microphone or phonograph volume. These are clearly labeled, too. And sometimes you may find two tone controls, as in a fine radio, one to control the low frequencies, and the other the highs.

These controls are used just as you would use the corresponding controls on your radio or phonograph at home. In some projectors, you'll find the tone control marked "low" and "high"; in others, the high end will be marked "voice," as that is the setting that gives the best intelligibility, while the low end will be marked "music," as that setting gives the stronger bass quality most folks like in recorded music.

It is important to realize that each individual projector, and each film, will have its own best settings for tone and volume. You can play the same reel on two different projectors — even of the same make—and find you'll require different tone and volume settings. Different reels, naturally, will have different recording characteristics, and will require different projector settings to get the best out of them. There is no fixed rule for making these settings: go by what sounds best to you—and don't be afraid to change tone or volume during a reel if you think you can make the sound quality better.

If you can, it is always a good idea to have some sort of a rehearsal before putting on a show, so that you can familiarize yourself with the characteristics of the projector, the sound-quality of the film, and the acoustical quality of the auditorium. In this connection, remember that if you rehearse in an empty auditorium, you will need to step up the volume a bit for the actual performance, for the bodies of your audience will absorb a surprising lot of the sound. Speaking generally, try to keep your volume level such that if you stand in the middle of the auditorium and listen, it will be right. If you try to guage the volume by what you hear back by the projector—even if it is blimped—you will usually get it too loud to suit the average audience.

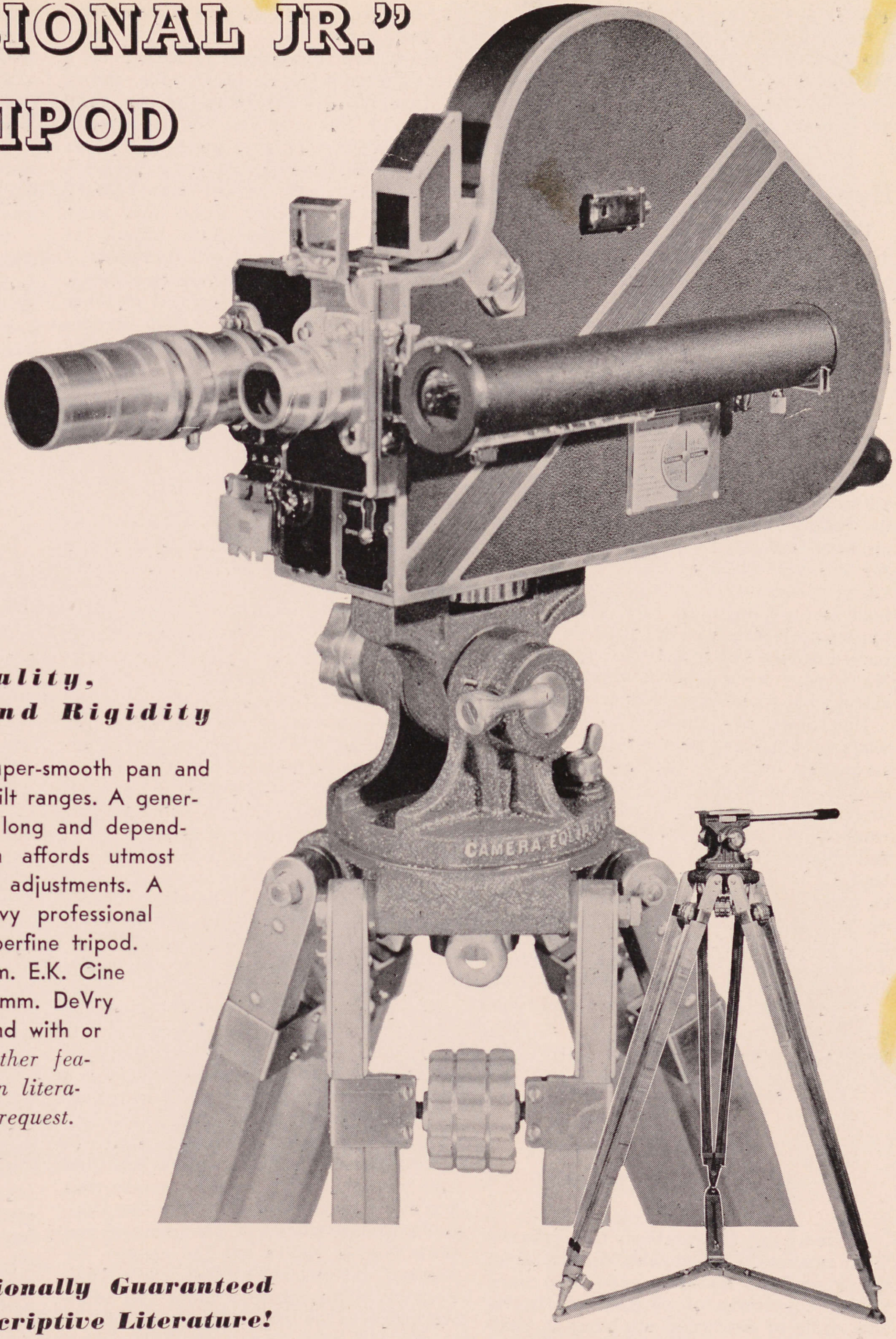
Similarly, it is handiest, of course, to put the loudspeaker (or loudspeakers, if you have one of the more powerful outfits) on the floor below the screen. But you'll get much better sound quality, and usually better volume, if you put the speakers higher up. The ideal position is behind and slightly above the screen, pointing slightly down toward the audience.

The actual operating controls of the projector, as a projector, are usually separate from the sound controls, though they may be grouped on the same panel in some designs. There are separate switches for turning projector and sound on and off, a separate switch for the projection-lamp, and in some machines, a separate control for running the projector at silent or sound speeds.

When you start a show, remember that while the projector and the projection-lamp start instantaneously, the amplifier—like a radio—usually requires a minute or so for the tubes to warm up. So make it a habit to turn on the amplifier several minutes before the show is due to start. Some 16mm. projectors have a little telltale pilot-light to indicate when the amplifier is on and ready to operate; others don't. But you can nearly always tell when the amplifier is ready for action by one or both of two signs. In many projectors, the exciter-light at the sound pick-up doesn't go on until all the tubes are warmed up and operating. And always, when the amplifier is on and everything is functioning, you'll hear a little hiss coming from the loudspeakers, and caused by the glow from the exciter-lamp affecting the photocell of the sound pick-up and sending a little "background noise" through the reproducing system.

Anyone who has ever given silent movie shows before an audience knows that it is a "must" to have a spare projection lamp available at all times, in case the one in the machine burns out—as it always does at the most embarrassing moment. (Have you noticed they never seem to burn out when you're running your own film just for yourself—?) Well, in sound projection, you should add to this a spare exciter-lamp bulb. This is probably the shortest-lived part of the average sound projector—and without it, you just can't project sound. The photoelectric cells that translate the sound into electrical impulses for the amplifier and loudspeaker are

"PROFESSIONAL JR." TRIPOD



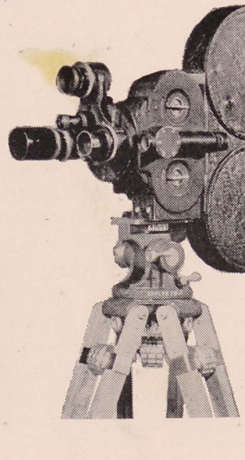
Unsurpassed in Quality, Versatility and Rigidity

★ The friction type head gives super-smooth pan and tilt action with 360° pan and 80° tilt ranges. A generous sized pin and trunnion assures long and dependable service. "Spread-leg" design affords utmost rigidity and quick, positive height adjustments. A "T" level (like those used in heavy professional models) is built into this 14 lb. superfine tripod. The top-plate can be set for 16mm. E.K. Cine Special, with or without motor; 35mm. DeVry and B & H Eyemo (with motor), and with or without alignment gauge. *Many other features are graphically described in literature that will be sent upon request.*

Tripod Head Unconditionally Guaranteed 5 Years. Write for Descriptive Literature!

"Professional Jr." tripods are used by leading Newsreel companies, 16mm and 35mm motion picture producers, the U. S. Government,—Signal Corps, Navy Department, and Office of Strategic Services—for important sound and silent work.

FRANK C. ZUCKER
CAMERA EQUIPMENT CO.
1600 BROADWAY NEW YORK CITY



Above—Collapsible and adjustable telescoping metal triangle. Extends from 16½" to 26½". Has wing locking nuts for adjusting leg spread and stud holes for inserting points of tripod feet. Triangles prevent damage, insure cameramen that their equipment remains in correct position and will not slip on or mar any type of surface.

Left—35mm Eyemo with motor and 400 ft. magazines mounted on "Professional Jr."

usually long-lived, but if you can carry a spare photocell, you'd better do it. In the same way, the amplifier tubes will take a good deal more use and abuse than those in a radio, but when they go, it helps to have a spare. END.

Hyperfocal

(Continued from Page 100)

f:11. This will give us 2x2 divided by 11 x .001, which evolves to 4 divided by .011 and in turn works out to a hyperfocal distance of 363 inches or 30 feet. At this setting, everything from 15 feet to infinity will be adequately focused.

For contrast, let's consider a very short-focus lens, like the 12½mm. lenses used on 8mm. cameras. Working it wide open at *f*:1.9, the formula would figure out as .5 x .5 divided by 1.9 x .001, which comes down to .25 divided by .0019, and gives us 131 inches or 10.9 feet as the hyperfocal distance for this lens at this wide-open aperture. Using the same figuring for the same lens stopped down to *f*:11, we find the hyperfocal distance in this case has moved up to 1¾ feet from the camera. No wonder we get such remarkable results with fixed-focus eights!

But there are times when we may want to obtain adequate focus on some secondary object or person nearer the camera than either the principal subject or the hyperfocal point. Or we may want to let our far limit of good focus fall short of infinity, to eliminate a disturbing background. In this case it will be useful to know something about depth of field, and how to make it work for us. Technically, depth of field means the distance between the nearest and farthest objects in acceptably sharp focus.

If you're mathematically minded, you can determine these two points by the following formulas:

$$\text{Near} = \frac{D \times H}{H + D}$$

$$\text{Far} = \frac{D \times H}{H - D}$$

In each case, D represents the distance from camera to object, and H represents the hyperfocal distance under the particular conditions of stop, focal length and circle of confusion applying to that particular shot.

To illustrate this, suppose we use the 2-inch lens we've been talking about, at its maximum aperture of *f*:2.5. We've already found the hyperfocal distance for it—133 feet. Assuming our object is 40 feet from the camera, we get this equation:

$$\text{Near} = \frac{40 \times 133}{133 + 40}$$

This equals 5320 divided by 173, and gives us approximately 30 feet as our near limit. In this same way we find the far limit of good focus by applying the second formula, which works out as 4x133 divided by 133—40, or 5320 divided by 93, and gives us 57 feet as the far limit of good focus.

Since the hyperfocal distance is a basic factor in these calculations, and it, in turn, varies according to the focal length of the lens and the stop being used, a little work with pencil and paper will show you just how and why the depth of field increases as the focal length decreases or smaller stops are used, and why with longer-focus lenses, or larger apertures, the depth decreases.

An understanding of these two simple optical factors—the hyperfocal distance and depth of field—can go a long way toward simplifying your focusing problems. As I said at the start, once you know how to put the hyperfocal distances to work for you, you will know how, and to just what extent you can make any cine lens serve in an emergency as a fixed-focus, though not always universal-focus lens.

And when you have familiarized yourself with the depth of field characteristics of your lens, you'll find you can make this factor work for you in two ways, as the professional does. When you want "pan-focus" or extreme-depth effects, you can get them by using a short-focus lens, well stopped down.

And when—as in making close-ups and the like—you want to focus selectively, so that your picture will concentrate attention on the subject, without intrusion from either the background or the foreground, you can do that by using longer-focus lenses and larger openings.

Neither a hyperfocal setting nor reliance on depth of field can ever altogether take the place of precise focusing on the subject. But they can come in mighty handy in emergencies!

Naturally, the figures that can be derived from these formulas can be reduced to the form of handy charts or tables. In fact they have been, and frequently, in such reference works as Jackson Rose's "American Cinematographer's Handbook." But sometimes you may find yourself caught in the field, wanting in the worst way to know the answer to some problem in this line, only to find that your chart is in the camera-case five miles back! And at a time like that, you'll be well ahead of the game if you know how to figure out the answer for yourself instead of relying on a hazy memory of figures in a table you probably glanced at only casually. END.

Professionalizing the Bolex

(Continued from Page 98)

turret, and to remount it in a false front-board as shown in the illustrations, without affecting the original separation between lens and film-plane. With this construction, the camera-head could be moved behind the lens on the shift-over very much in the manner of a 35mm. Mitchell.

The actual focusing system was provided by one of the excellent visual focusing systems made by Bell & Howell for use in their magazine-type "Filmos." This was simply mounted on the left-hand side of the camera, in such a position that when the camera-head was shifted to the right and up by the shift-over mechanism, the ground glass of the focusing system was brought into place behind the lens, and precisely in the focal plane. This provides a completely accurate focusing system which gives a highly magnified image, right-side-up and laterally correct.

When the camera is shifted back into photographing position, the regular Bolex finder, mounted just above the focusing magnifier, is aligned with a rectangular opening in the false front-board. Another opening gives access to the front starting-button of the camera's spring motor.

The new base and front-board into which camera and shift-over are placed, and in which the turret is mounted, presented a perplexing construction problem under today's wartime conditions. Palmer's original plans called for a casting; but both foundries and metal have more important purposes to serve these days.

As a substitute, he finally utilized Masonite "presdwood" composition-board. This is non-strategic (and hence free from priorities), easily worked, and surprisingly strong. When painted with black crackle-enamel and baked for four hours at a temperature of around 200 degrees, it takes a crackle finish which makes it indistinguishable from metal. Using the camera under the somewhat strenuous conditions of professional 16mm. production has indicated that this Masonite construction is very nearly as strong as metal, and considerably lighter.

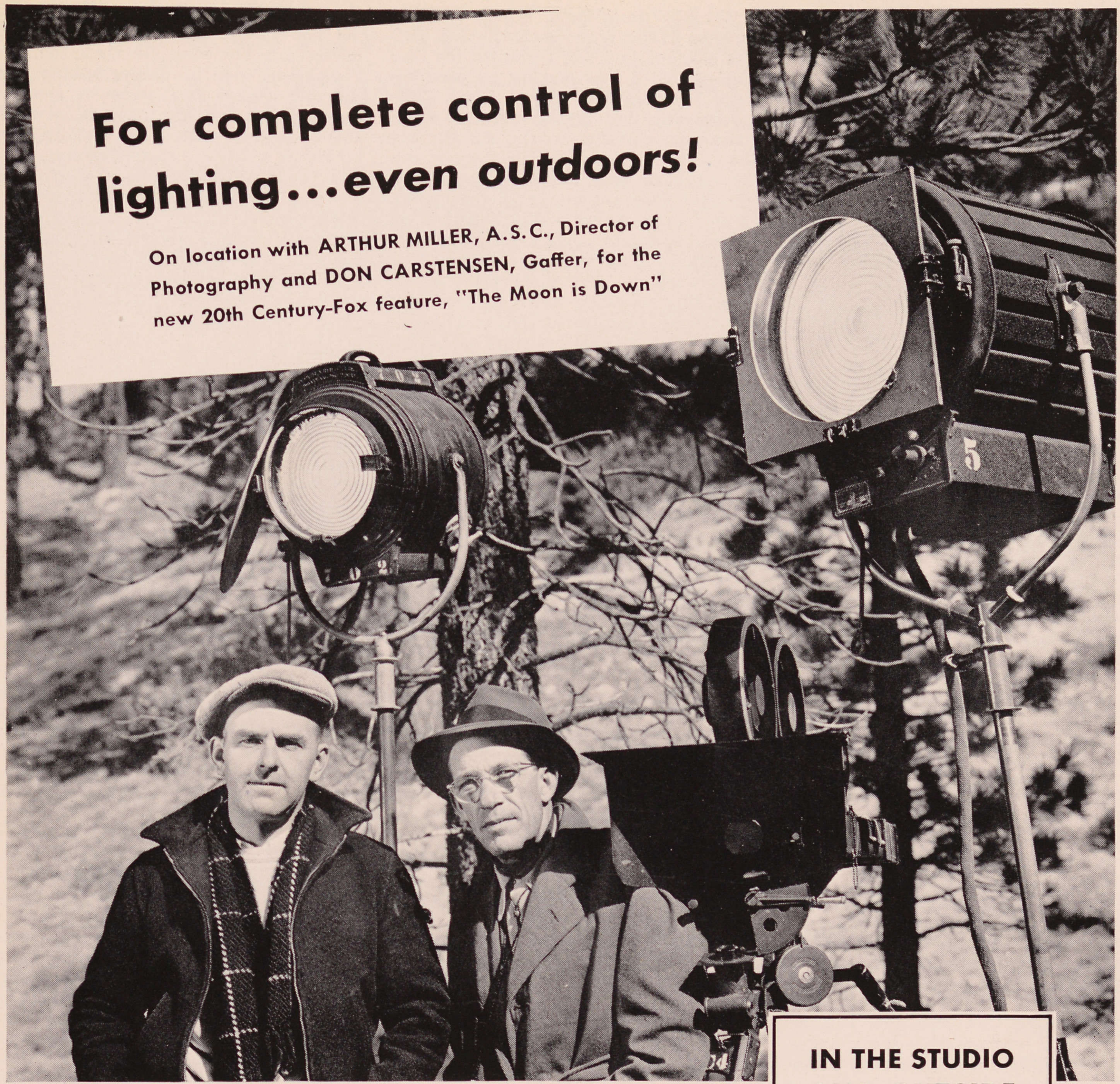
Palmer has also used the same material for the construction of the external, 400-ft. magazines shown in the illustrations. As will be seen, these magazines are mounted on top of the camera, and a curved segment is cut away at the bottom to permit the magazine to fit snugly over the curving top of the Bolex camera-box. Each of the two film-chambers has an individual cover, held in place by two small spring clips, and completely removable. This construction, incidentally, should be a convenience in the darkroom, or when loading magazines in a changing-bag in the field, when it is not always easy to fit a screw-type cover-plate into its thread.

The unexposed film is fed from the regular laboratory-packing core, which fits onto a spindle. The exposed film can be taken onto a similar core, or onto a regular 400-ft. projection reel. Palmer favors the latter, as it runs more true, and winds easier. Velvet light-traps are of course provided.

The only metal used in these ingenious magazines is that necessary for the spindles and take-up belt pulleys, the clips that hold the magazine covers in place, and the ingenious hinge-and-catch device that attaches the magazine to the camera. In this latter, a small bar or rod is attached to the front edge of the camera-housing, and a simple hook on

For complete control of lighting...even outdoors!

On location with ARTHUR MILLER, A.S.C., Director of Photography and DON CARSTENSEN, Gaffer, for the new 20th Century-Fox feature, "The Moon is Down"



Top-notch studio cinematography calls for complete control of lighting under all conditions . . . even outdoors.

And G-E MAZDA lamps in inkie booster units do a swell job on providing it, according to Director of Photography ARTHUR MILLER, A. S. C., and Gaffer DON CARSTENSEN, as they prepare to shoot an outdoor scene.

They say: "MAZDA lamp 'boosters' are essential in exterior cinematography. They enable us to control the shadow lighting as precisely as though we were working indoors on the stage. And light from MAZDA lamps is easier for the actors to look into."

IN THE STUDIO AND OUTSIDE
Lighting with
G-E MAZDA LAMPS
is flexible
—compact
—clean
—quick starting
—convenient
—and versatile

G-E MAZDA LAMPS

GENERAL ELECTRIC

the magazine is engaged with it. The magazine is then dropped down onto the camera, and locked in place with a small lever catch.

It is also noteworthy that this entire conversion was effected at negligible cost, from non-strategic materials, and is one which could be easily emulated by almost any 16mm. professional or amateur, or even 8mm. amateurs who own cameras of similar design. END.

Bob De Grasse

(Continued from Page 92)

a sequence, and the sequences into a complete picture.

"Meantime, I kept my nose to the grindstone on the set, too, and did my best to learn everything I could about the how and wherefore of photography. I must have learned something, too, for it wasn't very long after that that I found myself promoted to the rank of Second Cameraman.

"By this I don't mean that I did the work of the Second or Operative Cameraman of today. In those days, the Second Cameraman was the fellow who operated the additional camera that stood beside the First Cameraman's camera to record a second negative from which the prints for foreign distribution were made. In addition, he shot inserts and any minor scenes such as we'd turn over to a second unit today. Sometimes the Second was called "Associate Cinematographer;" I think that's really a more accurate term for what he did.

"At any rate, I served my apprenticeship in this post, and finally—it was about five years after I'd started in as an assistant—I found myself shooting my first picture alone, as a full First Cameraman. It was a western for FBO (the forerunner of today's RKO), starring Harry Carey and entitled 'Miracle Baby.'

"Considering that title, and the fact that at 23 I was probably the youngest First Cameraman in the industry, I suppose it would give this story a nice literary touch if I could say that I clicked from the start, and was hailed all around as the 'miracle baby' of camerawork.

"Only it wouldn't be true. Quite the reverse! 'Miracle Baby' was a decidedly unimportant little picture—just the sort of thing a green young cameraman could safely cut his teeth on, for as long as he managed to get a recognizable image on the film, the picture would make money with the small-town and juvenile audiences that demanded a 'western' every Saturday night. But good or bad, it would never come to the attention of the really important people of Hollywood production.

"However, I stayed on as a First Cameraman. I remained with Harry Carey as long as he continued to star for FBO, which was, I think, about two or three more pictures. Then I was simply switched to photographing other 'horse operas' with other cowboy stars.

"By the time sound began to come in some five or six years later, and FBO had changed to RKO, I reached the conclusion that I was making no progress fast. I was a full-fledged First Cinematographer all right, and had even gained membership in the A.S.C.: but the pictures I was getting were steadily less and less important. And by the time they put me to photographing a dog star, I decided I'd better do something drastic while I was still young enough so that with a fresh start I could work my way somehow into pictures that would in the long run give me more of an opportunity for advancement.

"So I deliberately quit as a First Cameraman, and went back to the position of Operative or Second Cameraman.

"And right there, my luck began to change. Operative Cameramen weren't quite as scarce as they are now, but I guess they weren't very plentiful, either. Anyhow, I found myself getting assigned to operate for some of the best cinematographers in the industry, and on some of RKO's biggest pictures. I worked with Eddie Cronjager, A.S.C., on 'Cimarron,' with Roy Hunt, A.S.C., on 'Dixiana,' and with other top-flight cinematographers like Leo Tover, A.S.C., Karl Struss, A.S.C., Nick Musuraca, A.S.C., and the rest, all on real 'A' productions. I was getting the finest sort of post-graduate course in really fine cinematography.

"After a few years of this—it was in 1931 to be exact—I had an opportunity to go to England as a First Cinematographer for Basil Dean's Associated Talking Pictures. I spent nine very interesting months over there, and then returned to Hollywood.

"Back home at RKO, I took things up where I had left off, and went on as an Operative Cameraman. It was my good fortune to be teamed pretty consistently with the late Henry Gerrard, A.S.C., who was one of the studio's top-ranking cinematographers, and one of the finest artists ever to use a camera.

"During those years, Henry Gerrard was particularly associated with RKO's biggest star, Katherine Hepburn. Indeed, she had insisted on having a clause in her contract which specified that she was not to be photographed by any other cinematographer.

"After his tragic death in 1935, both Miss Hepburn and the studio felt that as I'd been his fellow-worker on so many pictures with her, I was the man best fitted to carry on with them and give her the type of photographic treatment she had found so satisfactory.

"So once more I found myself a full-fledged Director of Photography—this time on top-flight 'A' productions. And thanks to the photographic polish I had gotten during those years as an Operator for so many of the industry's finest artists, I've remained as an 'A' picture cinematographer ever since. I did many pictures with Miss Hepburn up to the time she left RKO. One of them was 'Stage Door,' in which Ginger Rogers got her first chance at a straight dramatic part. She liked my work, too, and I switched over to photographing her. We did quite a long series of pictures together, not only the musicals in which she co-starred with Fred Astaire, but others in which she starred alone, up to and including 'Kitty Foyle,' for which she won the Academy Award two years ago.

"Since them, I've had my share of RKO's best pictures, and during the past year I've also had the privilege of making several pictures for other studios. That's an experience I think every cinematographer ought to have. Of course it's pleasant if your association with one studio can continue unbroken for year after year, as it has for so many of us; but there's also the danger that you may slide too easily into the narrow little routine of one studio. Getting out and making a picture on some other lot can be a stimulating tonic. After seeing how other folks in other studios think and work, you're bound to come back to your home lot with a fresh mental viewpoint which can't help showing up in your work.

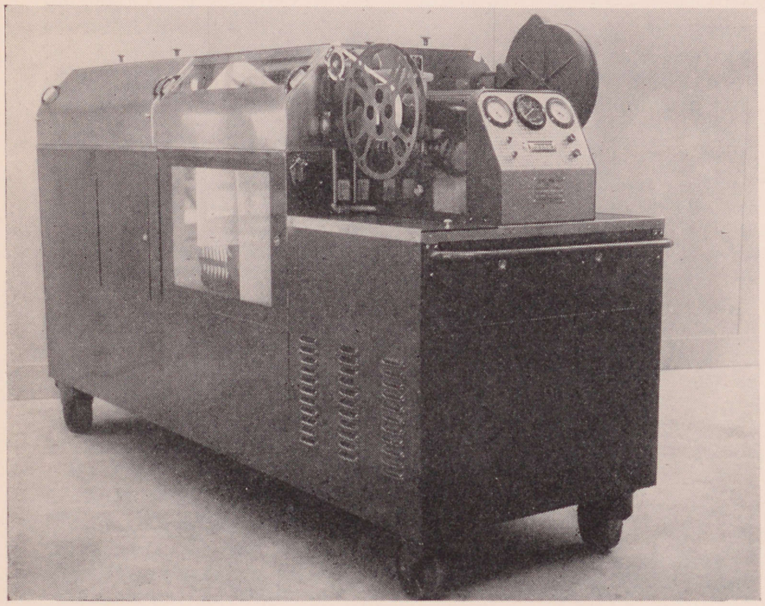
"My last assignment, photographing Barbara Stanwyck in 'Lady of Burlesque,' for Hunt Stromberg, was like that. And last summer, when Universal borrowed me to photograph Marlene Dietrich in 'Pittsburgh,' I'll admit there was an extra thrill in recalling that the last time I'd worked at that studio, nearly 23 years ago, it was as an obscure Assistant Cameraman!

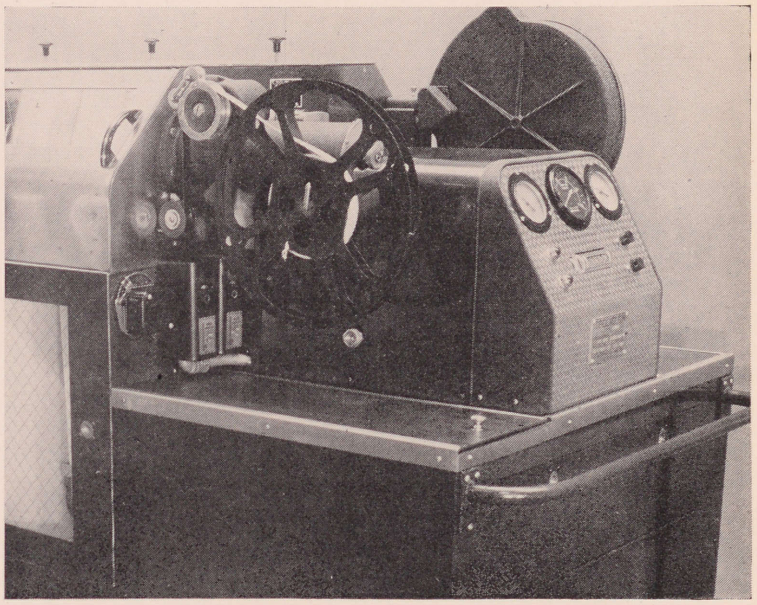
"Looking back on it all, I believe one of the most important things I can pass on from my own experience to younger cinematographers is the importance of taking your time and choosing the *kind* of picture upon which to make your debut as a Director of Photography. If you grab hastily at the first chance for advancement you get, it's likely to be on 'B' pictures or westerns—and once you get started on those, you can look forward to a fight every bit as long and heartbreaking as the one you've just finished working your way up, for cinematographers can get 'typed' just as much as actors. It's much easier to get onto these program films than to get away from them to 'A' productions.

"For 'B' pictures and 'horse operas' seldom give a cinematographer much chance to distinguish himself. They're usually made on the shortest of schedules, with cheap or remodeled sets, and with comparatively unimportant players. And once you get 'typed' as a 'B' picture man, it's almost impossible to make the front-office executives believe you can handle a big production or be trusted to make their valuable glamor-girls look lovely.

"But if you wait until you can make your start on at least a moderately good picture, you'll have a chance to show what you can do right at the start. Then if you have it in you, you won't have nearly so much trouble getting assigned to bigger pictures that

THOROUGHLY TESTED FILM PROCESSING MACHINES BY HOUSTON





THE HOUSTON 35 MM SPECIAL PURPOSE FILM DEVELOPING MACHINE.

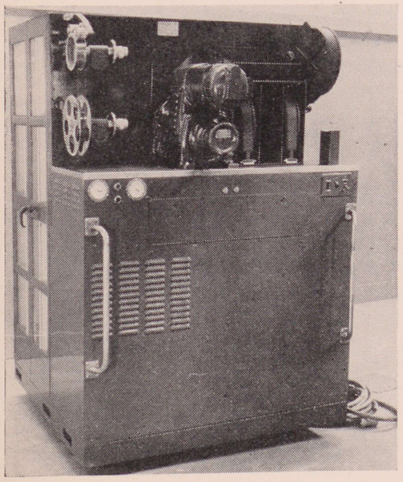
Special purpose means that this machine was designed for use in a limited space. Its dimensions are 78″ high, 48″ long by 42″ wide.

Either Negative or Positive film can be developed on this machine. Suitable pumps have been arranged to facilitate loading and unloading of solutions as well as operate proper turbulation to either developer.

This machine is white light operated, as suitable light tight magazines are supplied. It is equipped with variable speed transmission giving a range of film footage of 500 feet per hour to 2000 feet per hour.

The Dryer Compartment is equipped with Infra-red lamps for drying the film. Sections can be cut in or cut out as desired to suit atmospheric conditions.

The electrical load is 13 K-V-A at 220 volts.



THE HOUSTON 16mm NEGATIVE, POSITIVE AND REVERSAL TYPE FILM DEVELOPING MACHINE

This machine was designed and manufactured to serve a three fold purpose, that is, the developing of Negative, Positive and Reversal film in one machine.

Provisions have been made to by-pass the film from positions desired for any of the operations in a novel and practical way so that final results will be comparable to operations on a machine designed for a single purpose. The machine is of rigid construction and is a portable type, being set on casters and can be readily moved to any desired location. It is white light operated. All controls, such as Electric, Heating, Exposure Lamps, Pumps for turbulation of Developer, Filtering of the Water, Chemicals and Water Drains are all incorporated in this machine.

Electrical load is 12 K-V-A at 220 volts. Electrical specifications will satisfy any power requirements. Most excellent photographic results have been obtained from this machine.

●

These machines are completely self contained requiring no additional equipment and are crated and shipped completely assembled.

These most modern Film Developing Machines can be supplied through high priority rating.

For detailed information write

H. W. HOUSTON & COMPANY
(A DIVISION OF GENERAL SERVICE CORPORATION)
6625 ROMAINE STREET
HOLLYWOOD, CALIFORNIA

really give you a chance to distinguish yourself.

"Of course it's hard not to say yes the first time you have a chance to step up to a First Camera assignment. And it seems terribly long, sometimes, waiting for opportunity to give a better knock at your door. But it's a much longer and harder wait, I can assure you, trying to make your way up from the dead-end street of the program films. In my case, it took close to twelve years, and I had to swallow my pride and step down to operating and wait until the right opportunity came along. I'd have been years ahead if I had waited for the right opportunity in the first place."

Probably the most outstanding single characteristic of De Grasse's work is the fact that regardless of whether or not story, settings and action afford him opportunities for strikingly pictorial camerawork, he manages always to keep the players appearing uniformly at their best, and to carry through even a routine assignment with an effortless smoothness which, while it keeps the camera unobtrusively subordinated to story values, none the less reveals to the trained eye the touch of a real master of the camera.

"When I'm assigned to a picture," Bob will tell you when you bring up this subject, "I haven't any prearranged plan. Each picture is different: some give you a combination of story values, setting, and cast which give you a clear chance to go to town photographically; on others you've got to hold yourself in or your camerawork will dominate the picture to its detriment as entertainment. But whatever the conditions are, there are always the players to be considered. They're what the studio is really paying you to photograph; they're what the public is really paying to see. So as I figure it, your first duty is to see that the people are always as favorably photographed as possible.

"How you do it is an individual matter. Some stars are virtually camera-proof, and make this part of your lighting and camera job easy. Others demand specialized—even stylized—lighting and angles. When a player like this is the big star of the picture, you've got to see to it first of all that he (or she) gets that particular style of treatment first of all, even if you have to sacrifice a bit here and there with the rest of the cast or the action to do it. Then you have the problem of working in the rest of your lighting around this essential and often tricky set-up.

"For that matter, every picture is a challenge to the cinematographer. Especially under todays' conditions, with restrictions on this and shortages on that—not to mention rationed and many times made-over sets—it seems to me that almost every scene and set-up stands there and gives you a nasty grin, as if to say, 'You can't do it.' Then you've got to figure out some way to do it—even if it seems impossible!

"Sometimes you can go back into your own past experience and find some similar problem you met and licked years ago, and use a similar solution on the present headache. Sometimes you may have to go 'way back and remember what some veteran First Cinematographer for whom you operated did it. And sometimes you've simply got to come up with something really new in order to get that shot on the screen as you and the director want it in spite of everything. Whichever way it is, you can find a lot of enjoyment trying to lick those obstacles. You may get tired and worn out in this business—but with new challenges to your ingenuity coming up every time you make a set-up, you'll certainly not get bored!" END.

16mm. Vs. 35mm.

(Continued from Page 91)

work. In other words, color has the incontestable ability to portray form and texture in a more accurate way than can monochrome, partially making up for the two-dimensional limitations of the motion picture medium.

Of course, good monochrome photography can convey third-dimensional impressions, but they are not necessarily accurate ones. As a matte rof fact, this very ability of monochrome photography to present things not quite as they are, makes it the powerful entertainment medium that it is. It can glamourize or detract at will, depending only on the skill of the photographer.

But when the primary requirement is to portray things as they really are, to show the person being instructed by a training film what the device or situation really looks like, color is of such value that I would rate it tops. I would prefer a silent color film as a visual aid to a black-and-white sound film, even though I am thoroughly sold on the tremendous contribution of a *good* soundtrack.

Well, if the point is conceded that color is itself enough reason for considering 16mm. production, are there any other factors which make production in the small size impractical?

If you talk to someone accustomed to the usual 35mm. production, and who has undertaken direct-16mm. production in color, you are likely to get a whole roster of complaints about the problems that color introduces. He will first point out that the equipment available is inadequate, that the truly professional 16mm. cameras are as scarce as new tires. He will mention the problems arising from the short latitude of Kodachrome film, which makes necessary extremely precise exposure determination. He will complain of threadbare nerves obtained while waiting for the film to be processed, since Kodachrome is not handled on the super-fast schedule of overnight 35mm. service.

Further, he will complain of the difficulties in matching color in sequences when changing hours or days make skies and backgrounds look quite differ-

NO "DIM-OUT" IN NEW YORK—
IF YOU
C. ROSS
For Lighting Equipment

As sole distributors East of the Mississippi we carry the full and complete line of latest-type Inkie and H.I.-Arc equipment manufactured by

MOLE-RICHARDSON, Inc.
Hollywood - California

Your requirements for interior or exterior locations taken care of to the last minute detail anywhere

☆

MOTOR GENERATOR TRUCKS
RENTALS SALES SERVICE

☆

CHARLES ROSS, Inc.
333 West 52nd St., New York, N.Y. Phones: CIrcle 6-5470-1

ent. He will then go into the dearth of editing equipment of theatrical production caliber, the difficulty of making film effects except in the camera, the nonexistence of 16mm. sound-recording facilities for re-recording from upwards of six sound-tracks, or the problems of first-quality sound reduction prints. He may end up his case against 16mm. color production by pointing out that, if you have lived through these problems, your final 16mm. color prints will cost about five times as much as good black-and-white reductions from 35mm. negatives.

This dolorous series of problems which have come to some producers trying their first 16mm. color production are not so much an indictment of the 16mm. production as they are a result of attempting to apply very specialized and advanced techniques to a new medium in which the tools are admittedly somewhat elementary. The producers have tried too hard in attempting to use all their usual slick techniques before really being prepared to do so.

It is true that 16mm. camera equipment does not conform to 35mm. studio standards, notably as regards accurate parallax correction on finders. But it is largely through the elimination of many studio camera features, large magazines, electric drives, etc., that the 16mm. cameras get their ease of operation under tough conditions. The one essential feature for precise cinematography, a parallax-free focusing device, is available on several makes of cameras, and can be fitted to others without too much difficulty.

As for difficulty with latitude on Kodachrome, this should not be a great problem if the limits of the emulsion are not exceeded. It demands an entirely different type of lighting, both on exteriors and interiors—lighting which is much flatter, with only the subtlest suggestion of the usual modelling and backlight. Any attempt to use the conventional monochrome lighting will inevitably result in exposure troubles because the difference in brilliance between the highlights and shadows of good black and white lighting is just too great for the Kodachrome emulsion to span. This does not mean that the "professional" appearance of the picture is lost with a flat lighting scheme, for the modeling in light and shade is replaced by color contrast, giving equal opportunity for cinematic skill. This same factor, by the way, applies almost as much to 35mm. Technicolor as it does to 16mm. Kodachrome.

The slight differences in lighting conditions, which are inevitable with outdoor shooting, and give rise to uneven color quality, are unquestionably tough; but they can be licked. A good training film will consist very largely of close-ups where minor variations in color-quality should not be noticed, especially if compensating filters are used. Furthermore, even if there are some color variations, they still do not destroy the ability of color to give a more accurate impression of the real thing.

The time involved in processing Kodachrome and then making a cutting print to review as "rushes," is bad when working on a tight schedule when retakes are very costly. There can be a good deal of time saved by checking the original Kodachrome on a viewer like the Craig which, if properly handled, cannot harm the film. This does not entirely substitute for a projection of a duplicate, but should show any need for retakes. At the same time of checking the original, certain takes which are obviously unusable can be removed, making the editing job easier when it comes to matching back to the original, and reducing the footage to be work-printed for cutting purposes.

Again as in lighting technique, editing 16mm. Kodachrome for the time being must be handled differently from usual 35mm. practice. Although it is possible now to obtain 16mm. Kodachrome with key numbers, there are few duping facilities able to print the key numbers onto the cutting print. It is therefore desirable to keep a very careful slate record of every take, and to retain the slate code-numbers on each scene whenever it is shortened. The usual 35mm. Moviola equipment has been converted to 16mm. in a few instances, but these are very few, so it is necessary to make use of intermittent viewers operated between rewinds on the cutting bench.

Film effect work is another phase which has caused many to discard 16mm. production as not suitable to real professional techniques. Dissolves, montages, and super-imposures often play a major role in making a training film tell its story. These effects are all being done successfully by several concerns specializing in 16mm. production, and should be available for all essential training film uses. The fact that special-effects are not quite so easy to obtain might have the beneficial effect of holding them down to a minimum of really worthwhile contributions instead of allowing effects to be sprinkled in just to make the picture seem more polished. The less frills in a training film, the better it is, and special-effects should not be used as "window dressing."

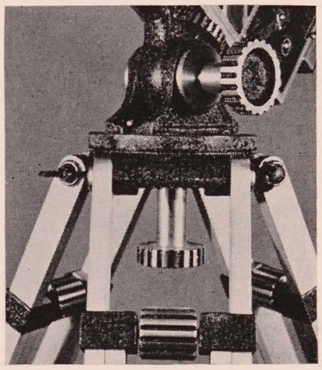
Along the same lines of unessential fanciness are spectacular sound-effects and musical theatrics which are most out of place in a training film, regardless of their value in an advertising or entertainment picture. This, then, eliminates most of the problems of sound-recording, for direct-16mm. sound leaves little to be desired for straight recording quality.

To sum up the case for 16mm. production, let some of the superior abilities of the medium be emphasized. The camera equipment is certainly more convenient to carry and use under the difficult shooting conditions which are the rule with training films. When necessary, a set-up can be made in a fraction of the time of typical 35mm. practice, improvised parallels sufficient for the 16mm. equipment offering little construction problems.

The depth of focus of the 16mm. camera lens equipment, even at wide apertures, is of tremendous advantage in many cases, "pan focus" being almost automatic under good light conditions.

There is a great saving in raw materials due to the shorter length of 16mm. for a given screen time, the instantaneous starting and stopping of the cameras, and the ability to discard bad takes even before the cutting print is made.

Eclipsing all other advantages of 16mm. production, though, is that it brings practical, first-rate color which enables the training film to do a better job. And finally, lest anyone bring up the contention that direct 16mm. production might lose an important film valuable 35mm. outlets, let us remember that thanks to the inherently grainless



CAMART PROFESSIONAL TRIPOD, complete with
DURABLE FIBRE TRIPOD COVER
Finely constructed tripod gives spring or motor driven camera rigid support and exceptionally smooth pan and tilt movement. Ideal for 16-35 mm. spring or motor cameras to accommodate Eyemo, Cine Special or others at no extra cost.
THE CAMERA MART, 70 W. 45 ST., N. Y. C.

TELEFILM
INCORPORATED
Direct 16 MM
SOUND
USED BY:
- Douglas Aircraft
- General Elec. (Welding Series)
- Boeing Aircraft
- North American Aviation
- U. S. Dept. of Interior
- U. S. Dept. of Agriculture
- Santa Fe Railroad
- Washington State Apple Commission
- Standard Oil of Calif.
- Salvation Army

and Many Others
A BETTER JOB FASTER—
MORE ECONOMICAL!
TELEFILM
INCORPORATED
6039 Hollywood Blvd., HOLLYWOOD, CALIF.
GLadstone 5748

structure of 16mm. Kodachrome, 16mm. is already being "blown up" to 35mm., in both monochrome and Technicolor, for theatrical short-subjects and for combat report-films publicly released by the Army and Navy. Thus properly-handled direct 16mm., in addition to fulfilling every other requirement of training film production, is the *only* medium capable of giving full-color release prints in *both* 16mm. and 35mm. without imposing the handicap of prohibitive cost. END.

Tempo

(Continued from Page 90)

Camera dissolves are used effectively in all sequences of "War Against Waste." For example, in one of the sequences the thought "Where does all the waste paper come from" is portrayed uniquely. We started with a caretaker and his pointed rod which speared pieces of paper out of the flower bed in front of one of the offices. With the camera on the ground one can see only the caretaker's feet and action of the pointer. This dissolves into a waste basket near the legs of a lovely office stenographer. Pieces of waste paper were dropped into the basket, this lapping to armsful of waste paper in the blueprint trimming department, a deluge of waste paper and boxes going into a large truck on its way to the paper baler, and, finally the neatly stacked piles of baled paper. Each scene is on the screen only long enough to let the audience know that paper gathered throughout the plant soon becomes a mountainous pile. With the dissolves the scene moves at a swift and even tempo and the full coverage measured but 50 feet of film.

Dissolves are also used effectively in showing how 48-inch grinding wheels are used and recut several times until the 24-inch hub remains. Without dissolves this action would be choppy and tempo would drag.

Another short, effective scene shows how a large piece of scrap steel plate was salvaged and two pieces of usable steel obtained from the odd-shaped original that was once sent to the foundry cupola. With the camera at a high angle, looking down on the original piece, the sections rapidly dissolve. The scenes are on the screen but one second, but the operation is readily understood and again the tempo is maintained.

The procedure for salvaging wood from boxes, crates, etc., of incoming shipments is similarly handled through dissolves. Quickly, smoothly, the dissolves cover the many places where this scrap lumber is used and re-used throughout the plant as spacers for piling and storing material. Each use is important, but more than six feet of any one scene would become monotonous.

It's true a cameraman can get into difficulties if a scene "flops" and that he must then start the dissolving sequences all over again. But as each scene is comparatively short, the operator was rehearsed and KNEW that the "cream of the operation must be on at the count of eight." It is also true that dupe negatives and optical printing dissolves or wipes would solve the cameraman's difficulties, but the delay in getting the finished dupe, the expense of added retakes and optical dissolves and loss of quality by printing from a dupe negative, we believe, offset the bugbear of a string of camera dissolving scenes.

Just because a reel holds a thousand feet of film is no reason why it must have a thousand feet. If the tempo of a film can be better held with less footage, act accordingly. Never forget that industrial films are meant for an audience of potential prospects and buyers of ones' products. To allow "padding" through inclusion of uninteresting and draggy footage in the film will affect the tempo of the audience as well as the film. END.

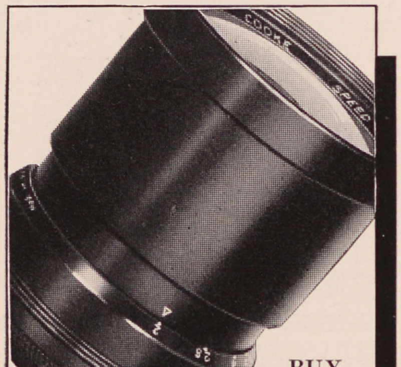
Special-Effects

(Continued from Page 89)

evitably be compressed, so that no words are necessary to tell the audience that this is a torpedoplane, or that is a carrier being dive-bombed.

In the documentary scene, you may see a downward-curving trail of black smoke. The narrator tells you it is a Jap plane which has been shot down. You seldom, if ever, see the actual hit or the plane's ultimate crash on the screen. The one may have occurred two or three miles above or to one side of the camera; the other, perhaps just as far off in another direction. Both of them far beyond actual camera-range. In a motion picture that is to be accepted for entertainment purposes, the camera must show the *entire* sequence of action: the approach of the attacker—close-ups that identify the plane's crew as enemies—men of our own forces serving their ack-acks—the actual hit on the enemy plane—the fall—and finally the crash into the sea. For forty years audiences have been conditioned to expect at least reasonable completeness of visual continuity in entertainment pictures: and while today they may accept less in films of a documentary nature, they would certainly feel something missing if that continuity were missing from an entertainment film.

The other day, I saw in a newsreel


BUY
WAR
BONDS

B&H-THC LENSES

Exceeding current technical demands and anticipating future requirements, these ciné lenses are truly long-term investments. Write for literature.

BELL & HOWELL COMPANY
Exclusive world distributors
1848 Larchmont Avenue, Chicago
New York: 30 Rockefeller Plaza
Hollywood: 716 N. La Brea Ave.
Washington, D. C.: 1221 G. St., N. W.
London: 13-14 Great Castle St.

RENTALS SALES SERVICE

MITCHELL Standard, Silenced, N. C., Hi-Speed, Process, and Eyemo Cameras. **BELL & HOWELL**

Fearless Blimps and Panoram Dollys—Synchronizers—Moviolas
35mm Double System Recording Equipment

WE SPECIALIZE in REPAIR WORK on MITCHELL and BELL & HOWELL CAMERAS

FRANK-ZUCKER
CAMERA EQUIPMENT CO.
1600 BROADWAY N.Y.C.
CABLE ADDRESS: CINEQUIP
CIRCLE 6-5080

"THIS year... I'm giving double!"
WAR FUND

a sequence which—as a newsreel—thrilled me. It was a suicide dive by a Japanese bomber into one of our aircraft-carriers. It showed a trail of black smoke—far distant and small—heading waveringly toward the camera. Just as one could begin to distinguish a speck which might be a plane, the scene abruptly ended, as the camera-crew very prudently dashed for armored cover. The next shot was of the blazing wreck of the plane, which had crashed against the carrier's "island" superstructure, close by the position of the cameramen when making the first shot, so the narrator said. As a news scene of genuine action, it thrilled me, for I knew it was the real thing. Cut into an entertainment film, it would have left me—or any audience—cold, because it left out the really dramatic parts of the action.

Only by shooting such scenes in miniature can we make them conform to the necessary pattern of entertainment-film continuity. We can compress a 200-ship convoy into the limits of our frame, showing the vessels trailing off into the distance as in reality, but making them big enough, and showing enough of them in the scene, so that we see and feel the dramatic impression of a real convoy. With miniature planes and ships, coupled with the use of miniature and full - scale projected - background scenes, we can portray the drama of an aerial attack, or the bomber's suicide dive, in a way that brings the audience the whole story in correct—and complete—sequence.

I am quite sure, for instance, that the Marines who actually defended Wake Island never saw as much of the Jap fleet which shelled them as Gordon Jenning's miniatures brought to the screen in the recent picture of that name: but the miniature sequence in the entertainment film put over the dramatic import of the action in terms the movie-going audience could understand.

Two of our own recent productions—"Air Force" and "Action in the North Atlantic"—have involved just such problems as I have been discussing. In "Air Force" we had, among other things, to portray the sinking of a Japanese battleship by a Flying Fortress, and phases of the Battle of the Coral Sea involving attacks on Japanese carriers and warships by torpedo planes, dive-bombers and Flying Fortresses. In "Action in the North Atlantic" much of the action takes place in an Atlantic convoy, and climaxes in an attack on the convoy by a Nazi U-boat "wolf-pack," in which both surface ships and submarines are sunk.

It is not too much to say that both pictures depended upon special-effects camerawork to the extent that they absolutely could not have been produced without it. In both instances, every trick of the trade had to be called into action to get the scenes on the screen—miniatures, process-projection backgrounds, matte-shots, optical superimpositions, and multiple combinations of all four.

In these pictures, as is the case in every studio with productions of a comparable nature, a very considerable proportion of the films' ultimate release footage was handled by the special-effects personnel. In our case, this was immeasurably aided by the organizational set-up of the Warner Bros.' Special-effects Department, which, as laid out originally by Fred Jackman, A.S.C., and since continued and expanded, is virtually a studio within a studio. Almost every department of the studio has its counterpart in the special-effects organization. We have our own designers, art-directors and set-building facilities; our own camera and electrical equipment, personnel, and stage crews generally. The department has its own film-laboratory and cutting facilities, its own business office, and even writers.

Most important, I believe, under today's conditions, is the unit plan of organization under which the department now operates. Instead of rigidly centralizing the entire department's output under a single head, the department, under my general supervision, has been organized into units, each of which, under a capable special-effects director like Jack Cosgrove, who handled "Action in the North Atlantic," Roy Davidson, who had charge of "Air Force," and Lawrence Butler is capable of handling all the varied special-effects work on a group of several productions. With these units are teamed the best specialists in different types af special-process camerawork—men like Hans Koenekamp, A.S.C., Ed DuPar, A.S.C., Rex Wimpy, A.S.C., Willard Van Enger, A.S.C., and Warren Lynch, A.S.C.

In my own position as Head of the department, this organizational plan

ANIMATED CARTOON EQUIPMENT

ACME 35MM 3 COLOR CAMERAS

16-35MM BACKGROUND PROJECTORS

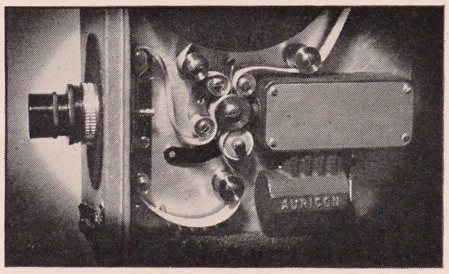
16-35MM OPTICAL PRINTERS

35MM CAMERA REPAIR

ACME TOOL & MFG. CO.

2815 W. OLIVE AVENUE
BURBANK, CALIFORNIA

Auricon
SOUND
CAMERA
for 16 mm sound-on-film



★ High Fidelity Sound

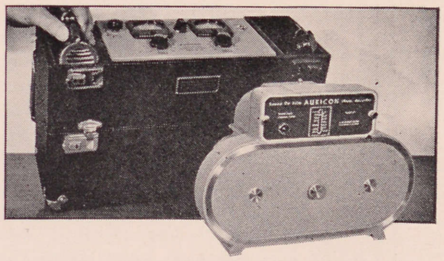
★ Self-contained in sound proof "blimp."

★ Minimum equipment; maximum portability. Camera and Amplifier, complete, weigh only thirty-seven pounds.

★ Kodachrome or black and white pictures with Auricon sound track will reproduce on any sound-film projector.

★ Can be operated in the field from an Auricon Portable Power Supply.

★ Auricon Camera with type "C" lens mount (but without lens) and Amplifier complete with microphone, instructions, and cases $880.00



AURICON 16 mm RECORDER

★ Variable-area sound on film, for double system recording with a synchronous motor driven 16 mm. camera. Amplifier has background-noise reduction and mixers for combining speech and music. With dynamic microphone, instructions and cases for Recorder, Amplifier, Accessories $695.00

★ Auricon 16mm. sound-on-film recorders and cameras are serving the Nation s War effort with Military and Government Film Units, and with civilian organizations producing essential morale and industrial training films. If your work in such fields makes you eligible to purchase new equipment, we invite you to let our engineers show you how Auricon portability and professional performance will simplify your recording problems.

AURICON Division,
E. M. BERNDT CORP.
5515 SUNSET BLVD., HOLLYWOOD, CALIF.

MANUFACTURERS OF SOUND-ON-FILM RECORDING EQUIPMENT SINCE 1931

leaves me free to serve as a liaison between the department and the studio's executives and writers. In this way, perhaps for the first time in the industry, the special-effects work can be planned long before it is actually needed—written into the scripts before they have jelled into final form. This permits additional time for planning and staging difficult special-effects work, and often makes it possible to simplify production problems, or strengthen dramatic values by integrating special-effects contributions with the script at birth, so to speak, rather than as an afterthought.

It makes also for better scheduling and budgeting. This is increasingly important these days, for as the shortage of skilled technical and craft talent in this specialized field has increased, the costs of special-effects work have skyrocketed to a point which would have been unbelievable a few years ago. It is by no means uncommon for the special-effects sequences of an important major feature to include from half to two-thirds of a picture's release footage, and to carry a budget—for special-effects alone—a good deal higher than the entire cost of many a complete "A" production.

While these unavoidably rising costs are unfortunate, they are none the less doing special-effects work in general a good turn. Originally—and especially since the introduction of the projected-background process—special-effects work in general had been regarded largely as a means of either putting the impossible on the screen, or of getting a scene which would be prohibitively expensive if filmed conventionally, on the screen at a cost of only a few hundred dollars. Today the industry is being educated to realize that special-effects camerawork can be an increasingly valuable asset as it is given more time and money, and increased scope.

For example, in our recent productions we have been able to build miniatures on larger and yet larger scales, which have been considered impossibly expensive a couple of years ago. We have had to: the scope of the action has in many instances outgrown the confines of studio tanks. For many of the "Air Force" and "Action in the North Atlantic" miniatures we used the Pacific Ocean off Santa Barbara as a miniature location. Our miniature battleships were so big that two of them completely filled a 50-foot railroad flat-car en route to the location. And necessary mechanisms for manoeuvering the ships, firing the guns, creating explosions, etc., could not have been operated in smaller-scale vessels.

Under today's wartime restrictions, we are finding new uses for special-effects techniques, too. For example, until today's priorities on transportation virtually eliminated all travel which is not absolutely essential, and the coastal dim-out regulations eliminated the making of night exteriors, whenever we needed a background scene we didn't already have in our library, we considered it a matter of course to send out a skeleton crew to photograph those backgrounds wherever they might happen to be. Today, we make the backgrounds in the studio, on matte paintings, backings, miniatures, or a combination of all three. And we are finding that backgrounds made this way are even more suitable for our purposes than most actual exteriors.

A very spectacular example of this occurred in the filming of "Mission to Moscow." One sequence showed Walter Houston, as Ambassador Davies, leaving Germany for Russia. In Germany, the Nazi officials had striven wordily to impress upon him what an impoverished and peaceful country Germany was. But as his train pulled out of Hamburg, he looked from his car window and saw troops swarming on the station platform, mechanized troops on the roads, and the whole countryside an arsenal of warlike preparations.

Obviously, it was impossible to send a camera crew to Hamburg to get these shots—even if the R.A.F. has left enough of the Hamburg Bahnhof to photograph! So we created them on the stage, in miniature, using foreground miniatures with miniature backgrounds and forced-perspective backings, each of which was arranged to move past the camera at a different speed, so that the completed background shot gave the same differential perspective of movement in the different planes that one would get in a full-scale shot of the real thing. In some instances miniature figures provided the people in these backgrounds; in others, full-scale shots of actual people were added by multiple printing.

This technique has proven so successful that we make almost all of our background plates this way. Indeed, once the war and its restrictions are over, I am inclined to doubt if we will go back to the old method, for this gives so much more complete control over every phase of the background-plate—action, composition, lighting, dramatic camera-treatment, etc.—that it is really preferable from every viewpoint.

Another wartime problem we have to face in special-effects work no less than in regular production work, is that of the restrictions imposed on new construction in sets, props, and the like. Careful planning of special-effects scenes

"Goerz American"

PRECISION

OPTICS

since

-1899-

★

BECAUSE OF THEIR ACCURACY THEY ARE DEPENDED UPON BY OUR ARMED FORCES ON LAND—ON THE SEA —IN THE AIR

★

"GOERZ AMERICAN"
PHOTO-LENSES

play an important part in the war program and our production is now keyed to fill the requirements of our Government. Within limitations we may still be able to supply Goerz lenses of certain types and sizes for civilian use. We suggest your inquiries through your dealer or direct.

ADDRESS DEPT. AC-3

C. P. GOERZ AMERICAN OPTICAL CO.
American Lens Makers Since 1899
Office and Factory
317 East 34th Street, New York

CAMERA SUPPLY COMPANY
ART REEVES
1515 North Cahuenga Boulevard
HOLLYWOOD Cable Address—Cameras CALIFORNIA

Efficient-Courteous Service
New and Used Equipmnt
Bought—Sold—Rented
Everything Photographic
Professional and Amateur

can go a long way to minimize this problem, but there is another step I feel should be taken for the benefit of the industry as a whole.

For a number of years there has been a certain amount of informal interchange of equipment and, to some extent, set-pieces and large props between the special-effects staffs of the different studios. On "The Forest Rangers," for instance, Farciot Edouart, A.S.C., at Paramount, rented the excellent triple-head background projector built by Vernon Walker, A.S.C., at RKO, for sequences for which two of these "triples" were needed. In the same way, we have borrowed set pieces and equipment from other studios, or loaned ours to them.

But it seems to me that this procedure could be carried a good deal farther than it has been at yet. Several years ago the major studios organized a special-process patents pool, in which all existing patents on special-effects processes were pooled, and through which any studio could, by contributing its share toward the development costs, make use of any new inventions in this field developed by other studios.

I think a similar arrangement can be and should be made with regard to a pooling of special-effects equipment, set pieces, props, and the like. A comprehensive index of these items could be organized, and a pooling arrangement worked out, with adequate provision for ensuring suitable care and maintenance of such items when used by another studio. A year or so ago if you taxed your budget to build some specialized prop like a submarine interior or a device for manipulating full-scale or miniature planes in projection or miniature shots, and then found—too late—that some other studio had already constructed a similar item which you might just as well have used, it was only an irritation. Today, it is a waste of materials, money and labor which, in wartime, borders on the criminal. Let us hope that through some organization like the A.S.C. this problem can be constructively remedied before long.

As to the future of special-effects technique and its production utility, I believe we are only at the beginning of a chapter of tremendous potentiality. When the war is won, and the present abnormally high material and labor costs of this specialized work drop back to more normal levels, I am confident that we will see an even greater use made of special-effects processes than is the case even under today's conditions. We have gotten over this idea that special-process photography is only a means of doing things cheaper; we are learning every day that it is a means of putting scenes on the screen better, with stronger pictorial and dramatic values, and with a more certain control over every element of the scene. And as this new concept takes hold and grows, I am certain that we will see the various special-effects techniques playing an increasingly great part in our constant aim to put better pictures on the world's screens. END.

African Desert

(Continue dfrom Page 87)

old kite seemed heavy, and heavy she was, for our tanks were full and we usually carried eight 250-pound bombs. It was always a relief to me to feel her lift herself clear and see the dust serpent die in its tracks.

We generally circled the field a couple of times gaining height and getting into formation before running out to sea or into the desert, as the case might be, before crossing into enemy territory. As we climbed up into the freezing level, my position was not a comfortable one for the rear half of my turret was open and it was my job to watch for possible enemy fighters coming from the rear or from above. As we had no heating appliance, my main concern was: "Would the cameras freeze up?"—a thought that made me feel even colder than the icy oxygen tube I held between my teeth.

I was always glad to hear No. 2 telling No. 1 over the inter-com that we had reached the position from which we would turn and run for our target. It was always a thrill to hear No. 2 announce that he had spotted the target and to hear his quiet voice directing us into position.

I would then start operating my camera, shooting the opening of the bomb doors and the bombs tumbling out. As the mount for following the bombs to the target was not complete—and besides we were too high to make it a good shot—I used to lean out over the side and try to follow them down.

After the flight, I always wondered at the great anxiety I felt from watching those deadly missiles sailing down on their mission of destruction, and at the great satisfaction I would have if the target seemed to be well plastered. With our bombs gone, the flak generally started; these black puffs appearing in the sky beyond our tail made a good shot.

Our mission accomplished, we would turn and streak for the wire. Sometimes, we would see the dust plumes of enemy

RUBY CAMERA EXCHANGE
Rents . . . Sells . . . Exchanges
•
Everything You Need for the
PRODUCTION & PROJECTION
of Motion Pictures Provided
by a Veteran Organization
of Specialists
35 mm. . . . . . . 16 mm.
IN BUSINESS SINCE 1910
729 Seventh Ave., New York City
Cable Address: RUBYCAM

for difficult shots — THE ORIGINAL
Scheibe's Monotone Filter
INDICATES instantly how every color and light value of a scene or object will be rendered in the finished print *before* taking the picture. -:- always ready.
GRADUATED FILTERS
Moonlight and Night Effects
FOG SCENES, DIFFUSED FOCUS AND OTHER EFFECTS
WRITE FOR FOLDER TWinoaks 2102
SINCE 1916
George H. Scheibe
ORIGINATOR OF EFFECT FILTERS
1927 WEST 78TH ST. LOS ANGELES, CAL.

8 Enlarged TO 16 Reduced TO 8
Geo. W. Colburn Laboratory
Special Motion Picture Printing
995 MERCHANDISE MART
CHICAGO

BUY WAR BONDS TODAY
focus and flash
with KALART tomorrow!
Write for literature
THE KALART COMPANY INC.
114 Manhattan St. Stamford, Conn.

MOVIOLA
FILM EDITING EQUIPMENT
Used in Every Major Studio
Illustrated Literature on Request
Manufactured by
H. W. HOUSTON & COMPANY
(A Division of General Service Corp.)
11801 W. Olympic Blvd., West Los Angeles, Calif.

FAXON DEAN
INC.
CAMERAS
BLIMPS-DOLLYS
FOR RENT
Day, NOrmandie 22184
Night, SUnset 2-1271
4516 Sunset Boulevard

fighters taking off from their fields. These did not worry us, for our old kite had a fair turn of speed and we had the advantage of plenty of altitude; our concern was for the fighters which might already be in the air.

When we crossed the wire, No. 3 would be told to open up his sending set and notify our base that the target had been bombed and that all planes were returning. This signal sent, No. 1 would ask for music, and we would fly home with music in our ears, usually coming from Radio Rome. For us, it is well that Musso did not equip his army with violins instead of guns, for with the former they would have been sure of victory!

All flights were not as easy and as pleasant as this, as a few notes from my diary will show:

“7-10-41: Took off 7:30 A.M.; flew 60 miles to sea; damn cold. 8:40: Reported to No. 1 twelve planes flying on parallel course between us and shore. They were about 8,000 feet below us. I checked my ’chute and cursed myself for having forgotten my Mae West.

“As we turned and ran for target, they also cut in toward shore. I lost sight of them. Didn’t like their movements. Bombed target at 9:30 exactly, from 17,500 ft. None of our protecting fighters in sight. (It was arranged that our fighters should meet us over the target and escort us back over the wire).

“About 9:30, I spotted what I thought to be four of our escort fighters overhead. Reported same and decided to get some footage of them. Got camera into position, but saw the ’planes were carrying black crosses.

“Told No. 1 fighters were Jerries; passed camera to No. 3, grabbed guns and fired at diving Jerry who was firing with cannon and machine guns. He levelled off below our tail. Other Jerries dived on squadron. They got a good reception from our guns. Squadron closed to very tight formation, nearly wing to wing.

“One German badly hit; he dove away. No. 3 plane of No. 3 flight attacked by two Jerries; port motor threw out oil and black smoke. Saw tracer bullets splashing on Jerry.; he pulled up and turned over just above me; could clearly see pilot clawing at cowling before he fell off into spin. Two remaining Germans break off fight.

“Our No. 3 ’plane unable to hold formation; he dropped away. No. 2 ’plane followed him. No. 3 ’plane landed at emergency field, badly shot up. Two rear crew members seriously wounded, gunner died on way to dressing station. All other ’planes of squadron landed safely.

“Army reported finding one German Me-109F just on our side of wire. Very sore because cameramount not ready for flight; missed marvelous chance for sensational footage.”

Yes, I missed a chance which never presented itself to me again, for a few days later I received a signal from Cairo telling me to report back to Headquarters. So I said “so long” to my South African friends, a grand bunch of men, promising to return as soon as possible.

As I was leaving, a mount which carried my camera between the guns was completed; it gave a fine angle showing the muzzles of the guns and the course of the tracer bullets. A remote-control to operate the camera fastened onto the gun handle near the trigger. The main difficulty was to get away from vibration when the guns opened up. Another mount was to allow the camera to follow the bombs down to the target; it was to be operated by No. 2, the bomb-aimer.

At H.Q. I was told they wanted me to go back to Tobruk for awhile, but promised to try to get me back in time for my low-flying strafing shots. Fearing they might fail, I was not altogether happy with this assignment although Tobruk was always a thrilling place to be in during the siege—this I had learnt during a few weeks’ stay in the early summer.

We left port before dawn on a very modern beautiful new type of ship. It was a beautiful trip until 3 P. M. when a high-flying Eyetie plane came over and let go six bombs. I was lucky to get three of these bombs hitting the water between us and a destroyer, really a good shot, and as they caused no damage, I was very pleased.

Things were again quiet until just after sunset when I think we were attacked by everything the Axis possessed: torpedoes, bombs from both high-level and dive-bombing planes, flare after flare. All this together with our ack-ack guns, which were many and varied, really made a spectacular display and provided me with enough light to get something really worthwhile.

I believe it was three rolls I exposed; however, it does not matter: the results are the same: no record, for a heavy bomb hit us and set our cargo of ammunition ablaze. . . . I regained consciousness a few hours later in a destroyer. What grieved me more than my wounds was to learn that my cameras and negatives had gone down with the ship.

All the foregone sounds like a mission that failed, mostly due to bad luck. Well, war photography is largely a matter of luck; but it also calls for the right equipment for the job, advance information, and the full co-operation of the senior officers.

The photograher with the Army should be as mobile as possible; his equipment *must* be light; therefore, I have long been an advocate for the man in this service to be supplied with 16mm. equipment.

The man with the Air Force must have his various camera-mounts to fit the types of ’planes from which he is likely to operate, *and should also be a fully trained air-gunner.* Here again, the size and weight of the 16mm. camera has great advantages over the “Standard” 35mm. equipment.

The man with the Navy is lucky, for his equipment can usually be Standard 35mm., and when he gets action, it is generally spectacular.

The war cinematographer must be keen on his job; he must have a cool head, an appreciation of danger; an understanding of maps and the use of the compass may prove to be of great value, and good deportment has never been a hindrance. END.

CLASSIFIED ADVERTISING

FOR SALE

IMPROVED DUPLEX 35MM PRINTER, with two Bell-Howell Cams and Shuttles. Perfect Registration for Color or Black and White, also process plates. Bell-Howell Standard Silenced Camera; Educational Blimp and Dolly; Sound and Silent Moviolas. Equipment slightly used at a big saving. Hollywood Camera Exchange, 1600 Cahuenga Blvd., Hollywood.

WE BUY, SELL AND RENT PROFESSIONAL AND 16mm EQUIPMENT, NEW AND USED. We ARE DISTRIBUTORS FOR ALL LEADING MANUFACTURERS. RUBY CAMERA EXCHANGE, 729 Seventh Ave., New York City. Established since 1910.

NEW FEARLESS interlock camera motor for N.C. Camera; Western Electric interlock motor for Standard Mitchell Camera (door type).
CAMERA EQUIPMENT COMPANY
1600 BROADWAY, NEW YORK CITY
CABLE: CINEQUIP

BELL AND HOWELL 3-PHASE CAMERA MOTORS, $135.00; RCA R-2 STUDIO RECORDER, $275.00; 2 ELEMENT GLOWLAMPS, $9.50; DEVRY SINGLE SYSTEM CAMERA; 3 LENSES; VIEW FINDER; AMPLIFIER; NOISE REDUCTION; POWER SUPPLY; 3 WESTERN ELECTRIC MICROPHONES; FRICTION TRIPOD; 5 MAGAZINES; SUNSHADE; MATTEBOX; CABLES; etc., $3,500.00. DUPLEX 35MM STEP PRINTER, $425.00. BERNDT AURICON 16MM RECORDING SYSTEM WITH NOISE REDUCTION, Like New, $595.00. S. O. S. CINEMA SUPPLY CORPORATION, NEW YORK.

7-100 FT. ROLLS EYEMO 35mm film supreme and plus X; date expired but guaranteed; $25.00. GEO. B. MYERS, Frankfort, Ky.

WANTED

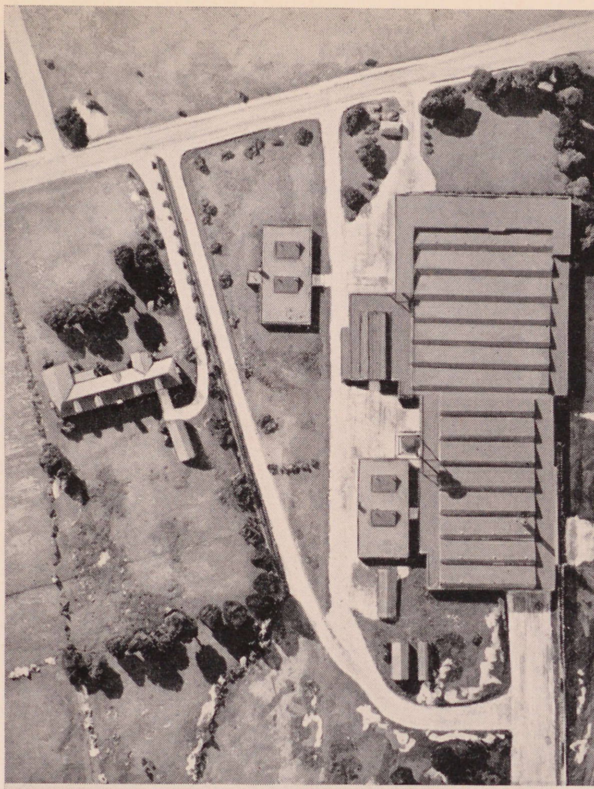
DEVELOPMENT ENGINEER WANTED with practical experience in 8 and 16mm. cameras and projectors. Permanent employment with large Chicago manufacturer now engaged in 100% war work, with assured post-war production. Excellent opportunity and substantial salary for right man. In first letter give age, experience, education, present employment and other qualifications. All correspondence held in strictest confidence. Our organization knows of this ad. Box 1002, American Cinematographer.

GUARANTEED HIGHEST PRICES PAID FOR 16MM. CAMERAS—SOUND PROJECTORS 35 MM. Eyemo Cameras, all models; Bell & Howell—Mitchell—Akeley and motors, lenses, accessories, lab. equipment. WRITE US FIRST.

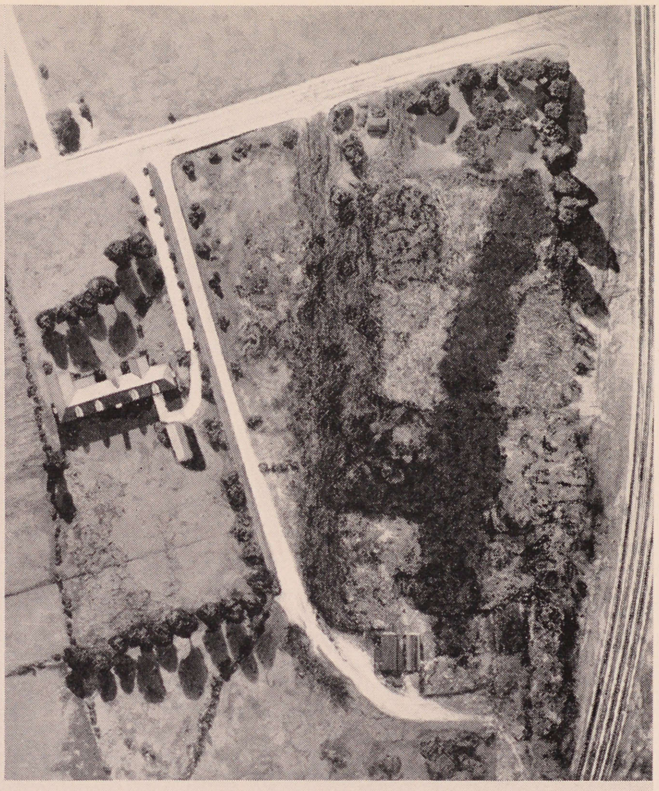
THE CAMERA MART, 70 West 45th St., N.Y.C.

WANTED TO BUY FOR CASH
CAMERAS AND ACCESSORIES
MITCHELL, B & H, EYEMO, DEBRIE, AKELEY
ALSO LABORATORY AND CUTTING ROOM EQUIPMENT
CAMERA EQUIPMENT COMPANY
1600 BROADWAY, NEW YORK CITY
CABLE: CINEQUIP

WE PAY CASH FOR EVERYTHING PHOTOGRAPHIC. Write us today. Hollywood Camera Exchange. 1600 Cahuenga Blvd., Hollywood.



NOW YOU SEE IT. Before the camouflage experts went to work, this factory—a model, for test purposes—was photographed from the air on conventional panchromatic film. The bomber's eye would see what you see—a perfect set-up for destruction.



NOW YOU DON'T. With camouflage materials—false structures, netting, cloth streamers, paint, and artificial trees—the experts have fooled the camera, and the bombardier. To the aerial camera loaded with panchromatic film, even the marks of erosion on the slope by the railroad track have disappeared.

Kodak Infrared Film spots the "make believe" of enemy camouflage

Camouflage is the highly developed art of pulling the wool over an enemy's eyes . . . an art which is finding old methods ineffectual, in this war.

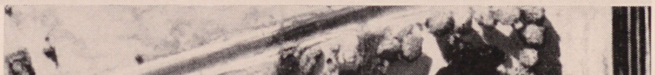
This is in a measure due to Kodak's development of a type of film whose vision goes far beyond that of the human eye.

Natural grass and foliage contain chlorophyll—Nature's coloring matter. Camouflage materials lack this living substance. Chlorophyll reflects invisible infrared light rays—and Kodak Infrared Film registers this invisible light, making the natural areas look light in the picture—almost white. In violent contrast, the "dead" camouflaged areas show up dark—almost black—in the picture.

Moreover, Infrared Film is able to penetrate through the haze of a "low-visibility" day, and return from a reconnaissance flight with pictures in clear detail. Here again it far exceeds the power of the human eye.

• • •

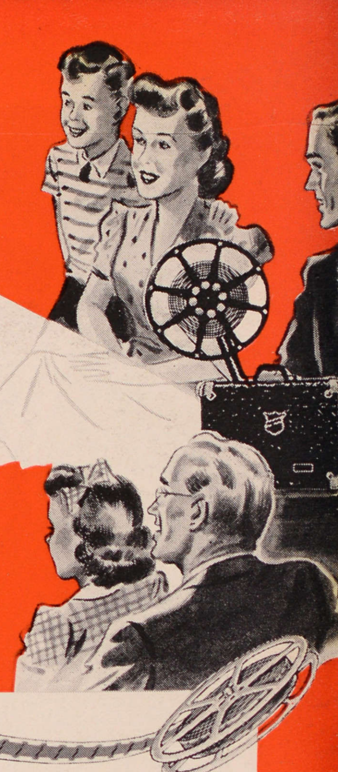
Working with our Army and Navy flyers and technicians, Kodak has carried this new technique of camouflage detection to high efficiency—and has, for our own use, helped develop camouflage which defies detection . . . Eastman Kodak Company, Rochester, N. Y.



BUT HERE IT IS AGAIN. With Kodak Infrared Film in the aerial cameras, pictures like this are brought back from an observation flight. On Infrared pictures, the false, "dead" camouflage materials look almost black. The natural landscape is unnaturally light. A trained camera man, with one look, knows where the bombs should strike.

Serving human progress through Photography

Lucky You?
Call It GOOD JUDGMENT!



Now that Filmo Cameras and Projectors have gone to war and no more can be built for civilian use until the boys come marching home, you probably feel that you are lucky to have purchased your Filmo home movie equipment while you could still get it. But we think you are to be congratulated for your *good judgment.*

You bought Bell & Howell precision-made home movie equipment because you wanted the finest personal movie equipment that advanced engineering and skill could produce. And that decision was good judgment—not luck.

You bought a Bell & Howell Projector because you realized that not any one or two features of design or construction make this projector outstanding—but a combination of *many* fine, *well-balanced* features, plus years of experience in the precision manufacture of fine motion picture projectors.

You wanted uniformly brilliant, flickerless pictures. You wanted positive gear drive—not chains or belts—but precision *gears* to drive everything from motor to shuttle.

You wanted film protection that protects film *all the way*—and *all the time.*

You wanted uninterrupted programs . . . high fidelity of sound whether high or low pitched.

You wanted the greater illumination provided by Filmo for showing color movies at their best, and the critical sharpness, fine color correction, and brilliancy of B&H projection lenses.

You wanted the Filmo condenser that can be withdrawn instantly by its external handle for cleaning.

You wanted the Filmo reflector, too, that is easily removed without tools for cleaning.

You wanted an easily accessible micrometer reflector adjustment.

You wanted to be able to remove the lamp by grasping its coolest portion—the base—and only Filmo offered that.

You wanted all of these features—and many others—found only in Filmo Projectors. So you bought Filmo—and that was judgment—not luck.

The same is true of your Filmo Motion Picture Camera. And while you cannot replace your Filmo home movie equipment for the duration—with reasonable care it will not need replacement. For Filmo home movie equipment is built in the painstaking way that assures fine performance long after you have forgotten the price you paid for it.

MOTION PICTURE CAMERAS AND PROJECTORS

Share your projector with your neighbors and help your country, too!

Give a movie party with a more important objective than merely entertaining your neighbors and friends. Use the magic of your projector to bring them a closer, clearer picture of just what a titanic struggle this global war is. Let them see the flaming inferno of modern battle. That will help them to realize more fully that we can win only with the all-out effort of every American everywhere—here at home as well as on the battle fronts.

See your B&H dealer for films from the all-inclusive Filmosound Library

The Filmosound Library offers you a practically unlimited variety of subjects from which to select. There are actually thousands of films available to you through this one comprehensive source—all on a purchase or rental basis. There are films that meet every conceivable type of interest, and that satisfy every audience taste. Films with sound or without, and often in color. Most of them 16mm., some 8mm. War films? Certainly—how would you like to see and show others, too, "Yanks Invade Africa," "U. S. Carrier Fights for Life," "Russia Strikes Back"?

Civilian Defense is represented by pictures like "Air Raid Warning," "Emergency First Aid," "Garden for Victory" and many more. Mail the coupon and we will send you the Filmosound Library Catalog which gives details of available subjects—plus bulletins on releases so recent that they have not yet been included in the catalog.

Two terrific battle actions in one film—

"U. S. Carrier Fights for Life"

Show this picture to your friends → and neighbors and they'll know that this war is serious business! Here's a picture that will put the audience right in the thick of the fight.

"Russia Strikes Back"

← Show them the flaming inferno of Stalingrad. Let them see what it means to defend one's home soil against invading Nazi gangsters! Rent or sale—Filmosound Library.

Bell & Howell Co., Chicago; New York; Hollywood; Washington, D. C.; London, ***Established 1907.***

ARMY E NAVY

BUY WAR BONDS

BELL & HOWELL COMPANY
1848 Larchmont Avenue, Chicago
Please send me film catalogs. I have a . . . .mm.
projector (sound) . . . . . . (silent) . . . . . . made by
. . . . I am interested
in renting . . . . buying . . . . films for entertainment . . . . . . education . . . . . . war . . . . . . Civilian Defense . . . .
Name . . . .
Address . . . .
City . . . . State . . . .

AC 3-43

PRECISION-MADE BY *Bell & Howell*